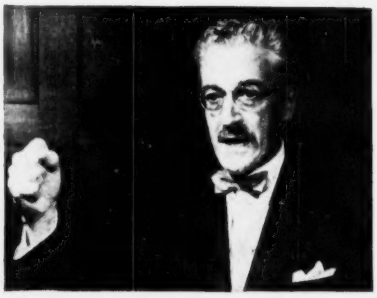
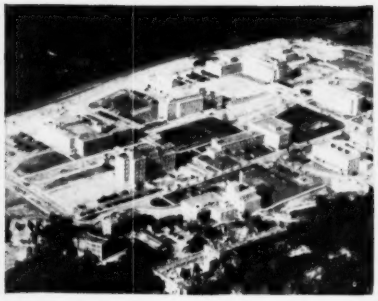
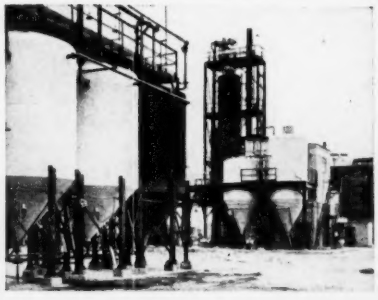
Chemical INDUSTRIES Week

May 12, 1951
Price 35 cents







Commerce's Concannon: Blasts NPA, ECA and British for chemical export muddle ..... p. 13

Newer organics oust old-line oils in anti-sunburn preparations p. 33

World's largest chemical research center; Du Pont plows $30 million into expansion ..... p. 21

Improved high-vacuum gauges provide better control, more uniform processing ..... p. 29

Cyanide uses: doubled this year, to be redoubled next. Sparkplug: synthetic fibers, acrylic polymers p. 41

A McGRAW-HILL PUBLICATION

INVESTIGATE THE PROPERTIES OF

Hydrazine and its derivatives

FOR YOUR POTENTIAL INDUSTRIAL USE

Mathieson produces Hydrazine, Hydrazine Hydrate, and Dihydrazine Sulphate in commercial quantities. Nine other Hydrazine derivatives are now available in limited supply. Listed below are the properties of these compounds and some known applications.

PRODUCT	FORMULA	COLOR STRUCTURE	M.P.	SOLUBILITY in H_2O	SUGGESTED USES
Hydrazine Anhydrous	N_2H_4	Colorless liquid	2°C	Completely miscible in all proportions.	Rocket fuel; reducing agent; chemical intermediate in preparation of insecticides, plastics, textile leveling, softening, and washing agents, textile resins, rubber softeners, explosives, antioxidants, stabilizers, photographic chemicals, dyes, and as a solvent.
Hydrazine Hydrate	$N_2H_4H_2O$	Colorless liquid	−50°C	Completely miscible in all proportions.	
Dihydrazine Sulphate	$(N_2H_5)_2SO_4$	White crystalline flakes	107–112°C	Very soluble	Reducing agent; convenient source of hydrazine for synthesis purposes.
Hydrazine Monohydrobromide	N_2H_5Br	White crystalline flakes	80°C Decomposes 180–200°C	Very soluble	Reducing agent; convenient source of hydrazine for synthesis purposes.
Hydrazine Monohydrochloride	N_2H_5Cl	White crystalline flakes	88–92°C Decomposes 240°C	Very soluble	Reducing agent; convenient source of hydrazine for synthesis purposes.
Dihydrazine Oxalate	$(N_2H_5)_2C_2O_4$	White free-flowing powder	Decomposes 80–130°C	Very soluble	Rubber accelerator; blowing agent; synthesis of hydrazine derivatives.
Copper Dihydrazine Sulphate	$CuSO_4(N_2H_5)_2$-SO_4	Blue free-flowing powder	Does not melt up to 300°C Slight decomposition below 200°C	Very slightly soluble in hot H_2O	Initial results indicate it to be an extremely effective fungicide.
Adipyl Dihydrazide	$NH_2NHCO(CH_2)_4$ $CONHNH_2$	White powder	177–182°C	Soluble	Miticide; reaction intermediate for polymer formation.
Adipyl Dihydrazide-Formaldehyde Polymer		White resin	155–160°C	20g./100 g. solution at 25°C.	Textile finishing, leather finishing coating and other synthetic resin applications.
Sebacyl Dihydrazide	$NH_2NHCO(CH_2)_8$ $CONHNH_2$	White leaf-like crystals	184–185°C	Soluble	Reaction intermediate for formation of polymers useful in the production of filaments, fibers or films or as agents for increasing the dye receptivity of synthetic fibers toward acid dyestuffs.
Hydrazodicarbonamide	$NH_2CONHNH$-$CONH_2$	White microcrystalline	245–250°C with decomposition	100 cc. boiling H_2O dissolves 0.70 g.	Reaction intermediate for polymer formation.
2,4 Dinitrophenylhydrazine	$H_2NHNC_6H_3$-$(NO_2)_2$	Violet prisms	194–198°C	Insoluble	Analytical agent for determination of aldehydes and ketones.

Complete information and samples of the listed Hydrazine compounds are available on request. Mathieson Chemical Corporation, Product Development Department, Mathieson Building, Baltimore 3, Maryland.

Mathieson
CHEMICALS

9001 T

SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

Chemical Industries Week

May 12, 1951

Volume 68 Number 17

OPINION 3
NEWSLETTER 7
BUSINESS & INDUSTRY 13
RESEARCH 21
PRODUCTION 29
SPECIALTIES 33
MARKETS 39
BOOKS 44
MEETINGS 44
BOOKLETS 48

PUBLISHER ..... Wallace F. Traendly
EDITORIAL DIRECTOR .... S. D. Kirkpatrick
EDITOR ..... W. Alec Jordan
EXECUTIVE EDITOR .. Richard L. Demmerle
MANAGING EDITOR . Howard C. E. Johnson

ASSOCIATE EDITORS: John J. Craig, Herman W. Zabel. ASSISTANT EDITORS: Joseph Gordon, Ralph R. Schulz. REGIONAL EDITORS: Frank C. Byrnes, Chicago; J. V. Hightower, San Francisco; James A. Lee, Houston. ART EDITOR: Woodhn G. Mizell, Jr. EDITORIAL ASSISTANTS: Claire Baker, Donald P. Burke, Leona Mahler, DOMESTIC AND FOREIGN NEWS SERVICE: McGraw-Hill News Bureaus in principal cities of the U.S. and throughout the world.

Consulting Editors:

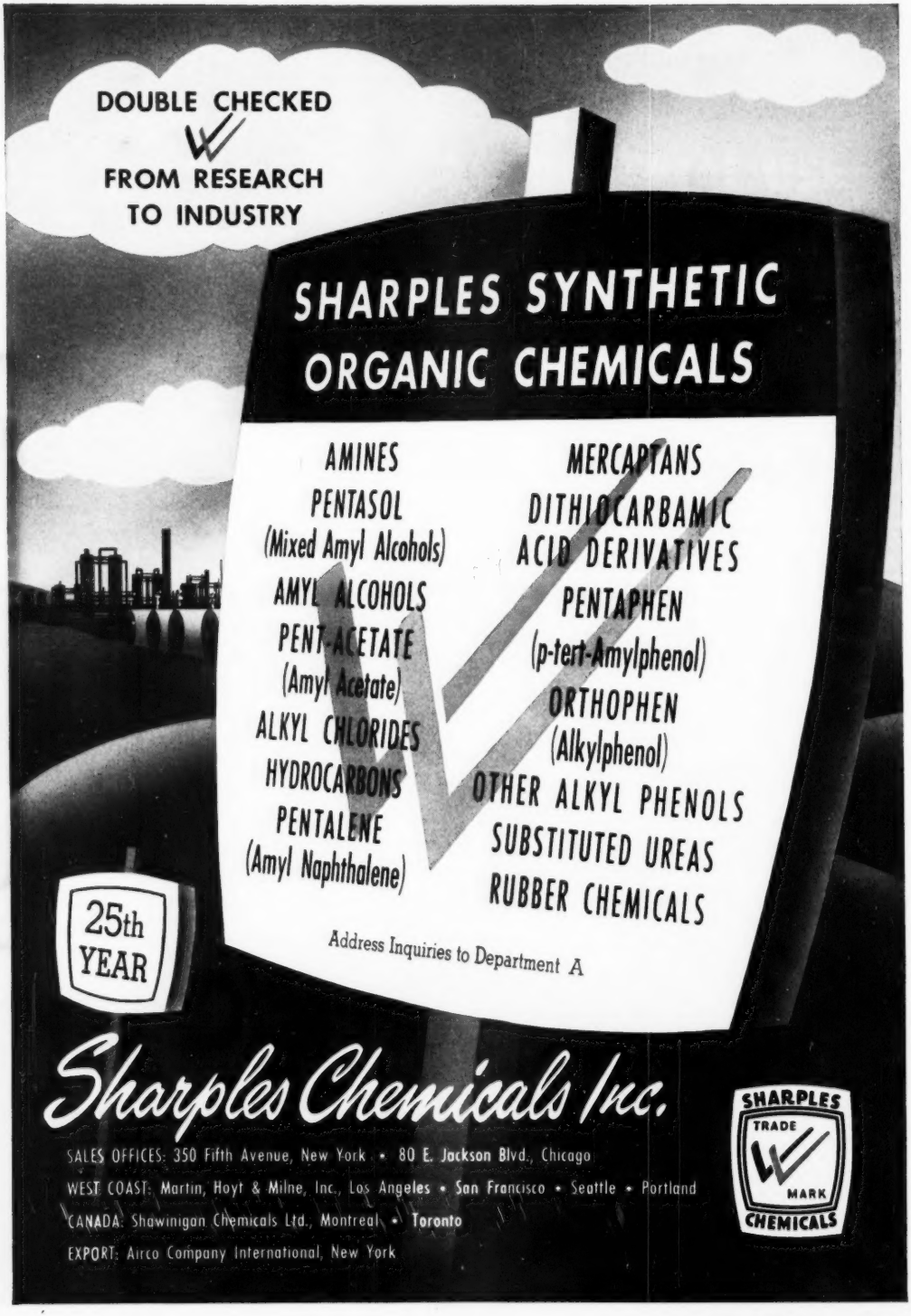
Lawrence W. Bass — Ernest W. Reid
Benjamin T. Brooks — Norman A. Shepard
John V. N. Dorr — Roland P. Soule
Charles R. Downs — Robert L. Taylor

Chemical Industries Week (including Chemical Specialties) is published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Publication Office: 1309 Noble St., Philadelphia 23, Pa.

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N.Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions to Chemical Industries Week are solicited in the chemical and process industries only from management men responsible for corporate affairs, purchasing, sales, marketing, packaging, research or chemical functions. Position and company connection must be indicated on subscription order. Address all subscription communications to J. E. Blackburn, Jr., Director of Circulation. Allow ten days for change of address.

Single copies 35¢. Subscription rates — United States and Possessions $5.00 a year; $8.00 for two years; $10.00 for three years. Canada $6.00 a year; $10.00 for two years; $12.00 for three years. Pan American countries $7.00 a year; $11.00 for two years; $14.00 for three years. All other countries $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter April 5, 1951, at the Post Office at Philadelphia 23, Pa., under the Act of March 3, 1879.


DOUBLE CHECKED
FROM RESEARCH
TO INDUSTRY
SHARPLES SYNTHETIC
ORGANIC CHEMICALS
AMINES
PENTASOL
(Mixed Amyl Alcohols)
AMYL ALCOHOLS
PENT-ACETATE
(Amyl Acetate)
ALKYL CHLORIDES
HYDROCARBONS
PENTALENE
(Amyl Naphthalene)
MERCAPTANS
DITHIOCARBAMIC
ACID DERIVATIVES
PENTAPHEN
(p-tert-Amylphenol)
ORTHOPHEN
(Alkylphenol)
OTHER ALKYL PHENOLS
SUBSTITUTED UREAS
RUBBER CHEMICALS
Address Inquiries to Department A
25th
YEAR
Sharples Chemicals Inc.
SALES OFFICES: 350 Fifth Avenue, New York • 80 E. Jackson Blvd., Chicago
WEST COAST: Martin, Hoyt & Milne, Inc., Los Angeles • San Francisco • Seattle • Portland
CANADA: Shawinigan Chemicals Ltd., Montreal • Toronto
EXPORT: Airco Company International, New York
SHARPLES
TRADE
MARK
CHEMICALS

OPINION . . . . .

Not Working At All?

To THE EDITOR: Just wanted to say that I noticed with interest and a good deal of amusement the article "How to Sell to Government," (Mar. 24th) . . . implying that there was nothing complicated about making such sales and seeming to say that simply by following normal channels of procedure one can actually obtain desirable contracts.

May I beg to disagree violently—based on our first hand experience over the last nine months—with such plausible lines put out by the Navy's Procurement Office or any agency or agent similar to the referenced Mr. Underwood?

I am really surprised by your report . . . at a time like this, when reportorial investigation would show that the routine procurement system is not working at all, and that negotiated contracts (some most probably inconsiderate of the public's interest) is the order of the day. . . .

Yes, I have attended Small Business Clinics and listened to exactly the "dope" put out in this article and can assure you that unless you have some pretty good connections in Washington to go along with the procedure, you are not likely to be very busy today on defense work!

JOHN W. MACY
General Manager
Arapahoe Chemicals, Inc.
Boulder, Col.

CIW respects Reader (and shrewd businessman) Macy; doesn't altogether agree with him. Far from being naive and starry-eyed, CIW did not imply, nor should any reader infer, that ours was a report of a presto-quick way to get government orders.

Rather, we knew that many smaller companies were: (1) completely ignorant of bidding procedures; (2) making costly, avoidable errors in submitting bids. That's why CIW interviewed Procurement Officer Underwood, published the how-to-bid-and-common-pitfalls-to-avoid piece.—ED.

First Microspheroidal

To THE EDITOR: It was with a considerable amount of surprise that we read the following caption on the front page of your issue of April 21st:

"CIW Camera visits first plant to make microspheroidal fluid cracking catalyst."

American Cyanamid Company has for a considerable number of years manufactured microspheroidal fluid cracking catalyst at its plant in Fort Worth, Texas, and until recently was the only manufacturer of this product.

Cyanamid's first shipments in commercial quantities were made as early as 1946. We suggest that you check this fact. Also, we presume that your will thereafter, in an early issue, wish to prominently correct the statement made by your publication.

A. J. CAMPBELL, Division Manager
Industrial Chemicals Division
American Cyanamid Company
New York, N. Y.

In the caption, we erred. Sorry.—ED.

Freedom from Bias

To THE EDITOR: I subscribe to over 25 technical and scientific publications . . . to keep myself as well-informed as possible in these days of high pressure. Frequently, I find that there is not enough time to review all the publications. . . .

. . . You may be interested to know that I put CIW at the top of the list as a "must". I like your format and your freedom from bias. . . .

JEFFREY R. STEWART
Chemical Engineer
Department of the Navy
Washington, D. C.

Still New, Controversial

To THE EDITOR: . . . The article ("Wonder Drugs Snag New Laurels" April 7) presents a factual picture of the present use of antibiotics in feeds and does so in a very interesting manner. It is, of course, inevitable that in a subject so new, there must be some controversial points. For example, the statement . . . that, "A given amount of food will cause a greater increase in weight if an antibiotic is included." is not supported by all reports that have been published.

There is no question that the feeding of an antibiotic to chickens or pigs increases growth rate and brings the animals to a marketable weight earlier than would otherwise occur. This, of course, results in an improvement of overall efficiency . . . reduces such factors as labor and overhead . . . required for bringing the animals to marketable weight.

There is some disagreement, among investigators, however as to whether antibiotics actually increase efficiency of feed utilization. Some have reported such an increase in efficiency. Others . . . that growth rate is in-

OPINION . . . . . .

creased with no effect on efficiency of feed utilization.

The statement . . . that "Swine and poultry derive the most benefit, while other species of mammal are affected adversely more often than not," requires some qualifications. The only adverse effects of which we are aware occurred in ruminants in which the antibiotic interfered with the normal microbiological population of the rumen. Among non-ruminants, swine and poultry have received the most attention but there is evidence that growth rate of rats is also increased by the feeding of an antibiotic.

. . . You state that "Cost averages 15 cents a gram and ten grams are usually adequate for a ton of feed." These figures obviously refer to the pure antibiotic. It is . . . very important to maintain . . . the distinction between the pure antibiotic and the antibiotic feed supplement.

Fortunately, these supplements are now being labeled to indicate their potency in terms of pure antibiotic as indicated at the end of your article.

HUGH C. MCPHEE
Assistant Chief of Bureau
United States Dept. of Agriculture
Washington, D. C.

Atom Bleach

TO THE EDITOR: In your recent article on Powdered Bleaches you omitted . . . Atom Powdered Bleach. . . .

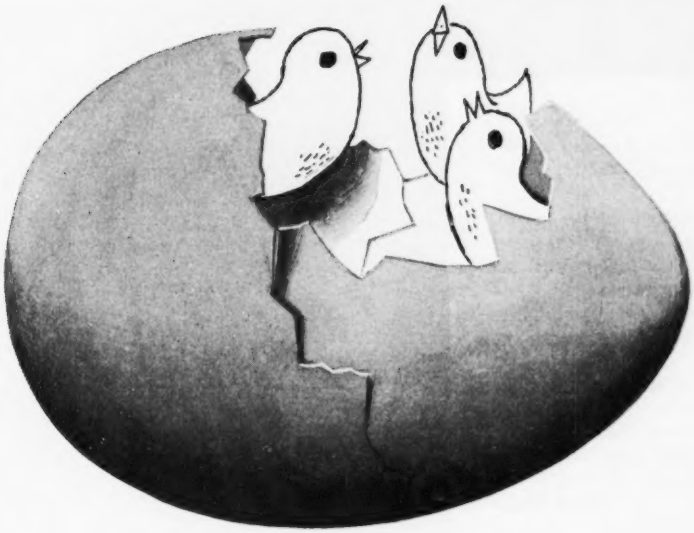
. . . Atom Bleach is packaged in quantity measured tubes, each containing the proper amount required for the average domestic laundry tub capacity, yet its harmless composition permits using this same amount in smaller quantities of wash. . . .

ADOLPH STRAUSS,
Strauss Associates,
Philadelphia, Pa.

We bumbled, overlooked Atom Bleach. Its composition: 97.5 percent dichlorodimethyl hydantoin, 2.5 percent Duponol ME. It contains 64 percent available chlorine by weight, is sold in 45 gm. packages for commercial laundering, 2 gm. units for household use.—ED.

CIW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Industries Week, 330 W. 42nd St., New York City.



3 caustics in 1

This is the true story of a soap manufacturer who was buying 3 grades of caustic soda from as many suppliers. He thought he needed all 3 grades to satisfy the requirements of his various grades of soap and different processes. But it was a lot of trouble to receive, handle and store these 3 separate grades. So he brought his problem to Wyandotte.

We were able to meet all of his requirements with one grade of Wyandotte Caustic.

Are *you* buying "too many" grades of caustic? If you think you are, why not talk over your specifications with Wyandotte's Technical Service Department?

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Michigan • *Offices in Principal Cities*

Wyandotte
REG. U. S. PAT. OFF.

Chemical Industries Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

It's getting to the point where chemical expansion isn't news, but a program as large as Dow Chemical's—$100 million in its June 1951-52 fiscal year—is hefty enough to make a splash.

Half of the money will go to the Texas Division alone, pointing up the low-cost raw materials advantages of the Southwestern area.

Products earmarked for upped output include chlorine and caustic, ethylene, perchlorethylene, and ethylene dichloride.

Private financing will cover the cost, but fulfillment of the program will depend on Government priorities for construction materials.

Everybody talks about bagasse utilization, but United Dye & Chemical Co., New York, will use this sugar cane waste to make furfural at a West Indies location. Of equal significance: United will thus become the second domestic furfural producer.

Also of technical notability this week, in view of pressing benzene needs, is news that Universal Oil Products Co. is working with a leading styrene producer on a solvent extraction process to obtain benzene from Platforming (catalytic gasoline improvement) effluent.

In Washington, the Atomic Energy Commission released seventeen patents—on a non-exclusive, royalty-free basis—covering diborane and lithium borohydride. The compounds are unique chemical reducing agents. For further information write AEC's Patent Branch, Washington 25, D. C.

A new insecticide base is exciting formulators' interest this week. Commercial Solvents Corp.'s nitroparaffin-derived insecticide, Dilan, received Department of Agriculture label approval for use on Mexican bean beetles and potato leafhoppers. Production (at Peoria, Ill.) is still small so availability of the material is limited.

Another insecticide, lindane, is getting a big push from California Spray-Chemical Corp., which handles sales of Hooker Electrochemical's production. Five new formulations for livestock pests are now marketed under the Ortho label, and the company has set up a special sales department. Two are wettable powders (25% and 12.9% lindane); two are liquid emulsions (20% and 12.5%); the other, a 1% dusting powder.

Household pets will be sales targets as well as livestock. Initial push will be through veterinary hospitals, but you may eventually see these Ortho formulations on retail store shelves.

Don't pay too much heed to reports, widely publicized this week, that the new blood plasma extenders, PVP and dextran, are harmful in treatment of shock due to severe burns.

National Institute of Health researchers, working with mice, found that mortality from kidney damage was higher among mice treated with the newer materials than among those given saline solution.

But the National Research Council, now officially evaluating PVP and dextran, report no cases of injury; and British workers have used dextran successfully in burn cases. Thus there's no reason to believe that the proposed stockpiling program (for atom raids) won't continue.

In Wilmington this week, Du Pont unveiled a research development for the scores of prominent guests invited for the dedication of its expanded Experimental Station (see p. 21).

The new development is GS silica—a proposed thickening agent for heavy-duty greases. Experimental greases formulated with the product are highly resistant to heat, water and mechanical breakdown.

In laboratory tests, the greases have stood up under punishment similar to that inflicted in wheel bearings of a truck driven in a tight turn at 50 miles an hour for 10,000 miles. Next: actual service tests.

Chemical firms hoping for government contracts are eyeing Defense Department budget requests. Of the $60.7 billion total, $122.5 million is earmarked for the Army Chemical Corps; and about half of the latter sum will be used for direct procurement and manufacture of chemical items. Another $24.7 million is for research and development.

On the other hand, the chemical industry—along with others—can look for a slow-up in NPA approvals of rapid tax write-offs on new capacity. Reasons: Much of the necessary expansion has already been approved; steel supplies are tightening. From now on, only strictly-for-defense facilities will pass trouble-free through the Washington mill.

Typical example is Dow's proposed expansion of bromine and ethylene dibromide (vital for leaded aviation gasoline). NPA authorized a 100% five-year amortization.

Washington clarified a point this week that had been confusing some firms: Only new companies—not in operation all of last year—are required to make quarterly reports to NPA of quotas on materials used for maintenance, repair and operating supplies (RO). Some firms, apparently misunderstanding Regulation 4, have gone to unnecessary expense and bother to make these reports. The regulation permits use of defense order (DO-97) ratings for procurement of such supplies.

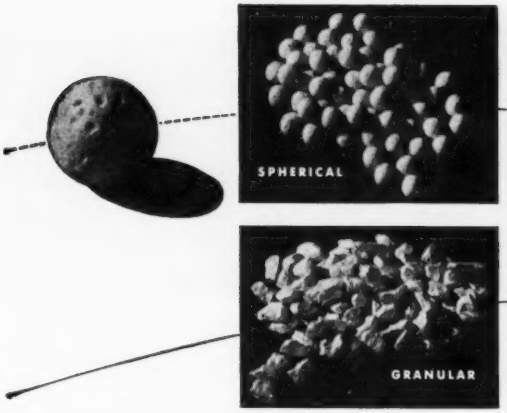
In another governmental area, the AEC made it clear that it doesn't have to pay awards under the Atomic Energy Act merely for submission of a process that may be useful. Arnold Pacyna, Chicago, claimed a lump-sum award for a process to recover uranium and vanadium from ores. But comparative tests—agreed to by Pacyna and AEC—showed that his process was inferior to methods in current use. Result: no grant.

Specialties companies are riding a couple of solid trends. First of these is chlorophyll, which has been getting a big push in breath deodorants. Now Lever Bros. is test-marketing Chlorogene, a chlorophyll-containing toothpaste, in Winston-Salem, N. C.; Columbus, Ohio; Portland, Me.; and San Diego, Calif.

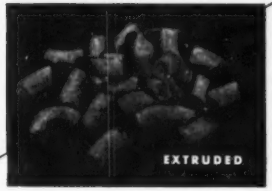
Also, American Chicle Co. (Chiclets) is avidly exploring possibilities of a chlorophyll chewing gum.

Another trend: large (5-lb.) aerosols. Hotels, restaurants, and other institutions have taken to them; and now the commercial exterminator is finding that the "economy-size" containers saves him time. He merely plots his course through his client's building, opens the valve and walks his predetermined path, and goes on to his next job.

. . . The Editors



preformed catalysts made to your specifications



by **HARSHAW**

HARSHAW

MORE THAN 12 YEARS AGO

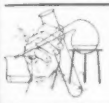
In 1938, Harshaw first began the manufacture of catalysts *to customers' specifications.* From a few catalysts for a few processes in 1938, Harshaw has continuously magnified its efforts until at the present time we manufacture, to specification, *dozens* of catalysts for many different important manufacturing processes. We have solved many individual catalyst problems, and are ready to apply our depth of experience and large production facilities to any catalyst development problem which may be presented to us.

The majority of Harshaw catalysts have been manufactured to customers' specifications on a confidential basis. Production facilities for spherical, granular, tabletted, extruded or powdered catalysts have steadily expanded, as research and experience have teamed to successfully assist in the development of many catalysts to meet special production requirements. We are ready to help you, too, solve your catalyst problem.

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

MONSANTO
CHEMICALS — PLASTICS

THE WORLD'S LARGEST elemental phosphorus plant, the Monsanto plant at Monsanto, Tennessee, now is expanding production. The largest phosphorus furnace in the world soon will be completed. The Monsanto plant, located on the Tennessee beds of rich phosphate rock, already has five furnaces in operation producing elemental phosphorus of better than 99.9% purity from which Monsanto quality phosphates are derived.



Research Chemists' Corner

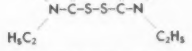
You may find something new here

With these three Monsanto chemicals, your research may reveal ways to improve products, create new materials or replace hard-to-get ingredients. If specifications given here suggest such possibilities, send for samples for experimentation. Samples will be sent to qualified persons without cost or obligation.

Tetraethylthiuram disulfide

—Bis (diethylthiocarbamyl) disulfide

STRUCTURE:



APPEARANCE: Light-gray to white powder.
SPECIFIC GRAVITY: 1.30 at 25° C.
MELTING POINT: 67° C. min.
SOLUBILITY: Soluble in acetone, benzene and naphtha.
ASH: 0.5% max.

SEND FOR BOOKLET — "30 Special Monsanto Chemicals" will be sent to you free upon request. Indicate your wishes on the coupon.

Tetramethylthiuram disulfide

—Bis (dimethylthiocarbamyl) disulfide

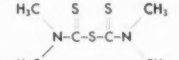
STRUCTURE:

APPEARANCE: White powder.
SPECIFIC GRAVITY: 1.29 at 25° C.
MELTING POINT: 146° C. min.
FINENESS: (200-mesh) 0.5% max. retained.
SOLUBILITY: Soluble in acetone and benzene.
ASH: 0.5% max.

Tetramethylthiuram monosulfide

—Bis (dimethylthiocarbamyl) sulfide

STRUCTURE:



APPEARANCE: Lemon-yellow powder.
MELTING POINT: 103° C. min.
FINENESS: (200-mesh) 1.0% max. retained.
SOLUBILITY: Slightly soluble in benzene, acetone and carbon tetrachloride.
MOISTURE: 0.5% max.
ASH: 0.5% max.

Santomerse No. 1 a versatile detergent and wetting agent

There's a good reason why Monsanto Santomerse* No. 1 is called the all-purpose detergent and wetting agent. The reason: *versatility.*

Santomerse No. 1 is used effectively for cleaning, penetration, dispersion, emulsification and spreading. With such versatility, all-purpose Santomerse No. 1 is adding to efficiency in numerous operations in industry.

Anionic Santomerse No. 1 has a minimum of 40%-active alkyl aryl sulfonate, the remainder being principally sodium sulfate builder. This is the combination found best for high efficiency and economy.

Santomerse No. 1 is effective in hard or soft water, in acid or alkaline baths, in hot or cold solutions. In operations where the pH is important, Santomerse No. 1 can be used because it does not affect the pH to any marked degree.

If you use a detergent and wetting agent in your industrial processes, look into the possibilities Santomerse No. 1 offers. Write for a copy of Monsanto's booklet, "*Santomerse No. 1 All-purpose wetting agent and detergent,*" which gives much useful technical information.

Sterox SE, SK, No. 5, and No. 6 rapid-acting wetting agents

If you have an operation that calls for wetting out, spreading, penetrating, scouring or emulsifying, look into the possibilities of the Monsanto Steroxes.

Sterox* SE and SK are 100%-active nonionic detergents which offer high sudsing and controlled dusting. Sterox 5 and 6 are like SE and SK, respectively, except that they are 85% active. All are liquids and all readily soluble in water at room temperature.

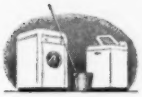
For complete details, mail the coupon for Technical Bulletin No. P-133 (on SE and SK) and Technical Bulletin No. P-136 (on No. 5 and No. 6).

These uses may suggest ways you can employ Santomerse No. 1

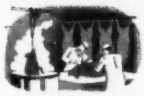
The uses for Santomerse No. 1 are so numerous that it is next to impossible to name them. Here are a few applications for the all-purpose detergent and wetting agent which may suggest other uses to you.

Metal Industry
Santomerse No. 1 in the acid bath for cleaning, treating or pickling metal improves operations and the quality of the work.

Railroad Car Cleaners
Santomerse No. 1 improves the detergency of acid-type cleaning compounds to remove scale and road grime.



Household Cleaners
Santomerse No. 1 formulations make excellent cleaners for home laundering, dishwashing, floor and woodwork cleaning and in numerous other cleaning jobs.



Dehairing Hogs
Santomerse No. 1 in the scalding vat speeds up the removal of hair and scurf.

Dairy Cleaners
Santomerse No. 1 adds to the efficiency of acid, neutral and alkaline dairy cleaners.

Agricultural Sprays
Used as a wetting and dispersing agent, Santomerse No. 1 increases the effectiveness of the spray.

Unload 'em quickly and send 'em home

If you buy chemicals in carboys, drums or tank cars, empty the containers as soon as you can and send 'em home. We suggest this whether they're Monsanto containers or not. The sooner your supplier gets back his containers, the sooner he can fill 'em and ship 'em to give you better service.

AROCLORS improve quality... economically ...in numerous paints and plastics

Many paints and numerous plastics gain extra qualities when Monsanto AROCLORS are incorporated into their formulas. And, since the AROCLOR * probably costs less than an ingredient it replaces, production costs are lowered.

The AROCLORS (chlorinated biphenyl and chlorinated polyphenyls) are used in modified and synthetic rubber coatings, lacquers, hot-melt strip coatings, vinyl protective coatings, maintenance paints, adhesives, fire-resistant paints and marine paints. With AROCLORS, the coatings gain in gloss, toughness, nonflammability and resistance to water, acids, alkali and other corrosive influences. Paints made with AROCLORS have excellent adhesion.

Various AROCLORS are employed in the plastics industry as coplasticizers with more expensive plasticizers.

There is a series of AROCLORS, both liquids and resins, from which you can choose exactly the properties you want. For details, mail the coupon or contact the nearest Monsanto Sales Office.

Monsanto Isocyanates offer possibilities in product development

Monsanto was the first American company to produce isocyanates, a group of German-developed industrial products which have many unexplored possibilities.

Already the products are being used in adhesives, paints, rubber, plastics and textiles. They are employed in the fields of high polymers, copolymers and terpolymers, and may have possibilities in medicinals, insecticides and other compounds.

At present, Monsanto is producing ethyl isocyanate, phenyl isocyanate, octadecyl isocyanate and p,p′ Diisocyanato-diphenyl methane.

If interested in the isocyanates, mail the coupon for a copy of Monsanto Technical Bulletin No. P-125. It's highly technical.

AN AROCLOR was used in compounding this Thermo-Dip plastic coat which is used to protect the metal gear from rust.

HB-40 used as extender for primary plasticizers

Monsanto HB-40 (partially hydrogenated terphenyl) is used as an extender for primary plasticizers in vinyls. As much as 25% to 50% of HB-40, on the total weight of the plasticizer, may be used. HB-40, being practically water-white, can be used in properly stabilized clear and tinted vinyl plastics. It is a low-cost plasticizer for styrene plastic dispersions and casting resins. Mail the coupon for details.

• • • • • • • •

MONSANTO CHEMICAL COMPANY, 1703-E South Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

*Reg. U.S. Pat. Off.

MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY... WHICH SERVES MANKIND

SEND INFORMATION: ☐ Santomerse No. 1. ☐ AROCLORS. ☐ Isocyanates. ☐ HB-40.

SEND LITERATURE: ☐ Booklet, "30 Special Monsanto Chemicals." ☐ Bulletin, No. P-125. ☐ Bulletin No. P-133. ☐ Bulletin No. P-136. ☐ Booklet, "Santomerse No. 1 All-purpose wetting agent and detergent."

SEND SAMPLES: ☐ Tetraethylthiuram disulfide. ☐ Tetramethylthiuram disulfide. ☐ Tetramethylthiuram monosulfide.

MONSANTO CHEMICAL COMPANY
1703-E South Second Street, St. Louis 4, Missouri

Please send, without cost or obligation, information, literature or samples as indicated at the left.

Name.....Title.....

Company.....

Street.....

City.....Zone....State.....

WHERE you get it...

DOES make a difference

When you place your order with Barrett you're assured prompt, dependable service and top quality products, backed by 96 years of successful manufacturing experience.

WHEN YOU NEED A COAL-TAR CHEMICAL – GET IT FROM...

- Phenols
- Cresols
- Cresylic Acids
- Chlorinated Tar Acids
- Xylenols
- Pickling Inhibitors
- Benzol
- Toluol
- Xylol
- Naphthalene
- Hi-Flash Solvent
- Phthalic Anhydride
- Dibutyl Phthalate
- ELASTEX* DCHP Plasticizer
- "ELASTEX" 10-P Plasticizer
- "ELASTEX" 50-B* Plasticizer
- "ELASTEX" 28-P Plasticizer
- Phenolic Resins
- Niacin (Nicotinic Acid)
- Pyridines
- Picolines
- Quinoline
- Lutidines
- Tar Acid Oils
- Neutral Coal-tar Oils
- Coal-tar Creosote
- CUMAR* Paracoumarone-Indene Resin
- Carbonex* Rubber Compounding Hydrocarbon
- Bardol* Rubber Compounding Oil
- Flotation Agents

*Reg. U. S. Pat. Off.

Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

CONCANNON AND BEVAN: Fist and finger are raised by American expert and British official over U.S. export controls.

Export Controls Blasted

American controls on exports of chemical raw materials hit by British official in speech before Parliament.

CIW interviews C. C. Concannon, U.S. Commerce Department chemical chief, who feels NPA, ECA policies must bear some blame.

Claims export restrictions fewer, hence end of "emergency" may bring real competition from foreign sellers in U.S.

Last week, in a stormy speech of resignation before the House of Commons, Aneurin Bevan, British Minister of Labor and National Service, took a lusty swat at what he called the "lurchings of the American economy" . . . and particularly at the manner in which these "lurchings" upset the chemical raw materials feeding trough of the British lion.

Bevan claimed that the production program of his country (and his party) could not be carried out unless they had "molybdenum, zinc, sulfur, copper and a large number of other raw materials and nonferrous metals which could only be obtained with the consent of America and other parts of the world."

This Side Too: But Bevan wasn't the only critic of the American export controls picture to speak his piece last week. On this end of the raw materials pipeline, Charles C. Concannon, head of the chemicals section of the Department of Commerce, had some vinegary words of comment to offer.

In an exclusive interview with Chemical Industries Week Concannon was anything but shy in his criticism of National Production Authority policies regarding exports. "Insofar as exports are concerned," snapped Concannon, "NPA thinks the world is flat."

On the subject of ECA, Concannon was as critical though a little less violent is his choice of words and meanings. He feels that the sulfur situation is "typical" of ECA's export policies, and that the agency must bear some of the blame for the current sulfur shortage in England today.

Forewarned: Concannon claims he warned the ECA and the Commerce Department's Office of International Trade about two years ago that the British should be encouraged to convert to pyrites. But only Belgium and France converted. "We must learn to realize that foreign demands (exports) of sulfur control the domestic market. We can say the same for carbon black and other chemical items."

Moral Obligation: Because of all this, Concannon feels that we have a "moral obligation to furnish sulfur to the British." When asked how much actual sulfur this "moral obligation" entails, the Commerce Department official replied that they should get as much as they got before Korea. In fact, he feels that both British and U.S. users of sulfur should get the same proportions as they were getting last July.

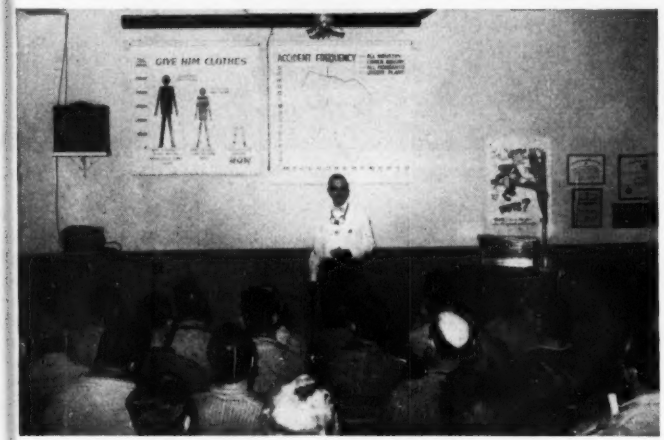
The veteran government chemicals expert is dead set against the idea of controls being exercised by the producers, as suggested to NPA last week. Government controls are necessary, he adds, to provide a share for all. But he doesn't like NPA's control by directive either . . . . claims these spot allocations are not publicized and, though legal, always appear to be discriminatory to most people.

British Not Cricket: Although Concannon feels that NPA isn't giving our

foreign trade the quantities of items it should have, he feels that the foreigners, particularly the British, are not playing the game fair. "We put a quarterly quota on sulfur. Immediately the British asked for a change. We refused. So the British followed a pattern, saying, 'we're satisfied but we'll have to draw ahead to keep our plants going,' and as a result they are overdrawn on sulfur for the first quarter of this year."

Concannon claims that he is wise to these situations as a result of past experiences. The government claimed that three years ago when he took over export control, phenol was being overdrawn by the British a year in advance. They finally overdrew so much that they never could "catch up." Finally the U.S. wiped the overdraft off the books and started a new year afresh.

Always a market: Fortunately, say Concannon and other experts, there are fewer import restrictions on chemicals than there are on other products because of the broad industrial use of chemicals. There is always a market. But no one can foresee what the situation will be a year or two hence. If the "emergency" passes and a quiescent period ensues, we may find plenty of chemicals to sell, but also many foreign sellers competing with us to make the "sale." Only the passing of time can write the true story of exports and imports.



SAFETY RECORD depends on training and . . . keeping employees interested.

Monsanto Safety Hits New High

Monsanto, one of the safest of chemical companies, is rapidly becoming more so. And this week safety reports circulating among the desks of the executives bear statistical evidence to prove it.

The accident frequency rate at Monsanto (to March 1) this year was 39 percent lower than for the corresponding period last year. And 1950 was a banner year at that, having only 1.80 disabling injuries per million man-hours worked.

Monsanto, like most major companies, uses the procedure of the American Standards Association in computing disabling injuries. And the first quarter score definitely places the midwestern chemical company right in the top running safetywise. Of the six big, general-line chemical companies, Monsanto is second only to DuPont from the safety standpoint.

In 1949, Monsanto had 3.03 disabling injuries per million-man hours worked. The chemical industry as a whole had 5.72. Industry wide safety figures for 1950 are not available as yet but Monsanto officials are confident that their company will show up well in comparison. If it doesn't it will be the first time since 1939 that Monsanto has not been significantly below the industry figure.

The man: Much of the credit for Monsanto's record is due to George Gorbell, the safety director for the company. Gorbell, a civil engineer by training, went with the company in 1947 after working as assistant regional manager of the loss prevention department of the Liberty Mutual Insurance Company in New York.

The program: According to Gorbell, the secret of his company's safety record lies in a combination of constant vigilance, the sufficient manpower to maintain the vigil. Thirty-six employees work on accident and fire prevention, a major part of their working time. One-third of these men make it a full time job. By long division this means that there is a safety engineer for every 700 employees at the company's larger plants. And even some of the plants with less than 700 employees have a safety director to call their own. One plant, less than 700 employees, has two safety men. Reason: A principal raw material is carbon disulfide.

The problem: Corbell says, that like most companies, Monsanto has reached a point where the engineering and physical hazards are pretty well eliminated. The big problem remains, however, of keeping the employees interested and conscious of the safety problem.

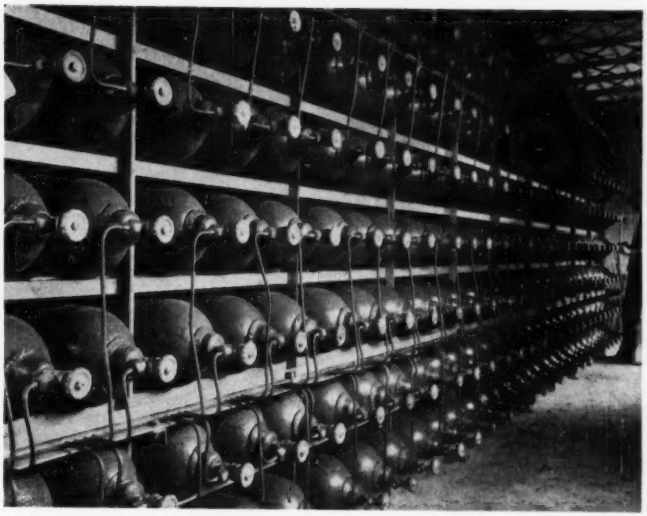
This entails a multi-point approach, most of which involves a constant campaign of education. Safety instruction of supervisors, regular inspection of plants to locate immediate or potential hazards, safety instruction for new employees and inspection of safety equipment are only a few of the duties of the safety engineer.

But above all, repeats Gorbell, the big problem of safety for employees is to "keep 'em interested." That's what keeps safety engineers awake at nights.

Curb on Containers

An order limiting the use of new and used steel shipping containers is in the works at the National Production Authority. One provision of the order would require that all drums used for transporting food, resin and turpentine would be given distinctive markings to insure their availability for re-use by those industries.

Last week, members of the Steel Shipping Containers Industry Advisory Committee met to discuss the proposed order. Industry representatives agreed with NPA officials on the need for an order, but recommended that containers used for foods or juices be exempt. They also asked that inventory provisions of NPA Regulation 1 be incorporated in the order, and the base period be the calendar year 1950. NPA did not commit it itself to following the recommendations, but said that it would give them careful study.



OXYGEN GAS CYLINDERS: Convenient to use, a problem to move.

Longer Haul for Oxygen

Demand for more oxygen boosts expansion, speeds swing to liquid shipments by major producers.

Better tank-wagon design for liquid shipment now permits longer economic hauls, means substantial freight savings.

Construction trend: Larger producing plants designed to profit by process economies and liquid tank transport.

Late this year, when the Butler, Pa. oxygen plant of Air Reduction Co. goes on stream, another 100 tons a day will swell the nation's ever-growing supply. Expansion of high-purity oxygen demand, forging rapidly ahead since World War II, now has acquired added responsibilties for metal fabrication via oxy-acetylene, is directly tied to defense mobilization.

Great strides have been made in improving oxygen processing and output. But now, with more oxygen to be transported than ever before, economy and speed in distribution have top-priority. Most significent development in the Air Reduction expansion, is the fact that shipments from the new plant will be in liquid form—in tank-wagons rather than in the familiar green cylinders containing high pressure gas. Tank contents can, of course, easily be transferred to cylinders for storage at the point of use.

This method of marketing oxygen is not new; another major organization in this field—Linde Air Products—has been emphasizing liquid shipments for the last few years. But Air Reduction, long established in cylinder shipments from numerous plants around the country, is now moving in on the liquid shipment business to meet customers requirements and provide new economies in manufactuuring and shipping. This general trend from gas to liquid transport has been fostered by improvement in tank-wagon design, shortage of cylinders, higher freight rates, and production economies resulting from larger-scale operation.

Lower Costs: Any manufacturer of bottled oxygen sooner or later asks himself whether to make the oxygen in a few large plants and ship longer distances, or to build many small oxygen plants near the market and try to minimize shipping costs. It is evident that no hard-and-fast rule can be cited to predict categorically that one system is economically preferable to the other in all cases. Suffice it to say that several technological changes in recent years have tended to emphasize the swing to fewer, bigger plants.

Other practical issues to consider include the deposits and tie-up of cylinders, a minor but persistent annoyance to both manufacturer and consumer.

On the other side of the economic appraisal, smaller plants have somewhat better flexibility to meet changes in demand of the nearby consumer, and can usually provide a faster service.

In Coming Years: Under present conditions of full-capacity operation and record consumption in the metal fabricating industries, high-purity oxygen from larger plants will be indicated in preference to the previously favored small plant for most new construction. As long as demand prods production, this conclusion should be valid.

These considerations apply with equal effect for tonnage oxygen (90-95%) which is heading for even greater demand peaks because of utilization in large-scale chemical oxidations and steel processing. These operations require an oxygen plant at the site, but it is not exactly reckless to assume that some of this production could be readily allotted for sale to smaller chemical producers, many of whom see many new possibilities from the use of low-cost tonnage oxygen.

And all this activity will point to tank-wagon deliveries of liquid oxygen, let the producers assess their favorable conditions of plant size to meet the rising demand now, and renewed competition later.

Enter General

Cashing in on the work of its successful research staff, General Tire and Rubber Co. (Akron, Ohio) heralds its entry into a new field by forming a chemical division. The primary function of the new division will be commercial production and marketing of products and processes brought out by its own laboratories, but General will not be averse to taking on production projects developed by scientists outside the company.

Although the new division marks its first splurge into the chemical industry, General does not come into the field as a novice. A research division has been functioning since 1945, now employs over 50 chemists. At present the labs are doing some top secret work on high polymers as well as work on standard chemicals as monomers for new synthetic rubbers and plastics.

One of the big developments that came out of General's research was the masterbatching of synthetic rubber and carbon black (1947). Another, more recent one, is the as-yet-confidential formulation for synthetic rubber (now in production in Sarnia, Canada). President W. O'Neil has guaranteed the RFC that this process will boost GR-S production by 22% . . . without additional expenditure for equipment or basic material.

Organization heading up the new division will be M. G. O'Neil, recently appointed assistant to the president. Under O'Neil will be Edward Osberg as assistant manager of production. His duties will be to coordinate sales, manufacturing and technical activities of the division. G. S. Schaffel has another key job in the organization—manager of manufacturing; Gilbert H. Swart will continue as director of research.

Construction of a new plant—to cost about $1 millions—will get underway immediately. Company officials refuse to discuss plant sites or type of production because of the classified nature of the work. They will say that production will begin before the first of the year—at an annual rate of between 7 and 10 million lbs. of products.

The division will have its own sales staff, but, at least for the time being, one is scarcely necessary. Production will center around a half dozen products which are all classified.

Executive Pay

In a special survey of selected chemical companies, CHEMICAL INDUSTRIES WEEK set out to determine how executives are making out salary-wise—including bonuses, retirement benefits, special stocks issued, etc. The companies were divided into 5 groups ranging from the very largest (total sales over $500 million) to the companies whose sales were between $15 and $25 million. Completed this week, the survey sheds light on the question, lends itself to some general conclusions:

(1) Executives in the first group made out very well indeed. Their mean and median pay was well over twice that of men in the second group.

(2) Salaries in the second group were substantially greater than those in the last three groups. Mean and median salaries (at $90,150 and $86,520 respectively) were roughly 50% higher than those of the remaining three.

(3) There was little difference in salary among the last 3 groups. In fact, salaries in the fourth group were higher than those in the third.

NPA Chemical Shift

The Chemical Division of the National Production Authority got a new boss this week. He is Kenneth H. Klipstein, American Cyanamid Company executive (on leave), who was upped from the post of Deputy Director of the division to fill the shoes of Joseph Bates, the voluntarily outgoing director.

New Chief: Klipstein brings a lot of heavy chemical background into the job of heading the group which decides what chemical goes to whom . . . and in what quantities. In the Cyanamid organization he holds the title of Assistant General Manager of the Calco Chemical Division of the company.

In his first statement as director of NPA's chemical section, Klipstein promised to carry out the overall NPA policy which seeks to insure supplies of critical materials for defense and defense-supporting needs with as little displacement to civilian industry as possible.

KENNETH H. KLIPSTEIN: Promises few upsets.

Old Chief: Bates, who led the Chemical Division through the early stormy months of its existence, is returning to his regular position as president of the Bates Chemical Company in Lansdowne, Pa. Reason: The pressure of his personal business affairs made it necessary for him to leave the Washington scene and return to lead the family-owned enterprise.

Prey to Synthetics

M. Werk Co., 119-year-old Cincinnati soap firm, is going out of business.

Werk Co. had its beginning in the turbulent days when Cincinnati, a leading hog market, was known as Porkopolis. It started out by making tallow candles, and ended up making soap—but not money.

SIZE OF COMPANY (By Dollar Volume of Sales)		COMPENSATION OF TOP EXECUTIVES			
		MINIMUM	MAXIMUM	MEAN	MEDIAN
	> $500 Million	$45,550	$539,550	$212,000	$219,115
> $100 Million	< $500 Million	27,635	167,121	90,150	86,520
> $ 50 Million	< $100 Million	28,539	126,310	63,600	60,895
> $ 28 Million	< $ 50 Million	25,836	91,909	50,160	59,430
> $ 15 Million	< $ 25 Million	25,497	107,318	57,250	64,033

Werk's four-story plant in St. Bernard, a Cincinnati suburb, and all equipment probably will be sold. Some of the company's divisions may go to purchasers as "going concerns", with continued marketing of some products—notably Werk's Tag soap, still a good seller. ("It sold better in 1950 than it did in 1949," says Werk Cook, president of the company)

In addition to bar soap, Werk also produced bulk soap, glycerine, stearic acid.

Kept Good Company: The Werk company was started before Procter and Gamble (founded in 1837) or Emery Industries (1840). All three were in St. Bernard. And in the early days, tallow was the main material for all three. They all made candles. Later, all three went into production of other products.

Emery manufactured fatty acids. P&G and Werk made soap. Werk's Tag soap became famous. (It had a little metal tag attached which could be redeemed for premiums.) And Werk also was a pioneer among soap companies in using radio advertising —on WLW, Cincinnati, back in the 1920's and early 30's—although P&G subsequently outstripped it in that respect.

Saw It Coming: When synthetic detergents began reaching the market, Werk management saw the handwriting on the wall but, so the story goes, lacked the financing to do much about it. It would have meant buying a good deal of new equipment. So Werk attempted to meet the competition by buying detergents and marketing them.

Capital stock of Werk was sold last January in a transaction involving about $1.2 million. Purchasers were four Cincinnati investors. They, along with Werk Cook, became directors. He remained as president. Thus ownership passed out of the hands of relatives of Michael Werk, the founder. Cook is a fourth-generation relative.

The new owners had plans to get into "a chemical line for defense work," according to their attorney. But they were unable to get "necessary materials." There's no elaboration on that point.

But there is talk in Cincinnati business circles to the effect that they were considering making gasoline jelly bombs, and couldn't get the necessary equipment because of the metal shortage.

Florida Ilmenite

What was an Army training camp during World War II—Camp Blanding near Starke, Fla.—is now producing about five carloads a day of titanium ore for Du Pont's paint pigments plant at Edge Moor, Del. Two years ago the Du Pont company leased 40,000 acres of the Camp Blanding reservation from the Federal Armory Board and employed Humphreys Gold Corp. to mine the ilmenite sand.

While the Florida ilmenite has a low concentration—about 3.9 per cent—poorer in quality, for example, than that mined in New York State, Du Pont foresaw the possibility that it might not be able to obtain enough ilmenite from other domestic mines and from abroad to satisfy its requirements; hence it tackled the Florida job despite the fact that some geologists and engineers considered it an almost hopeless proposition from the standpoint of economics.

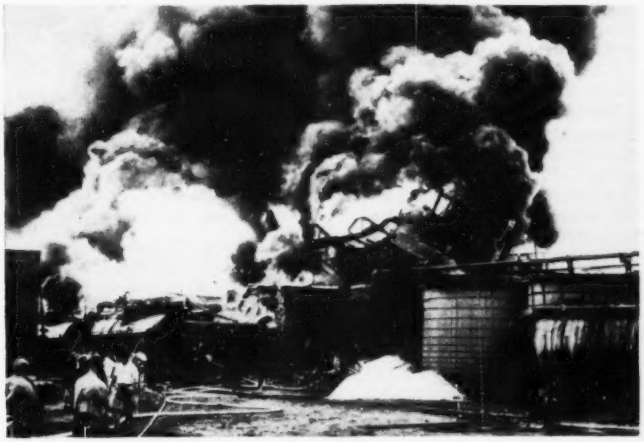
Not the First: However, ilmenite has been mined elsewhere in Florida for many years. Ponte Vedra Beach, on the Atlantic Ocean about 20 miles east of Jacksonville, was once the site of the National Lead Co.'s ilmenite development in Florida. Now National Lead is mining ilmenite about eight miles farther inland in the same general locality, and it also employs Humphreys Gold Corp. to do the work.

Humphreys had the know-how and the equipment necessary for this mining operation, which differs little from gold-mining. It uses a spiral separator which extracts the titanium-bearing ore from the sand. At the Trail Ridge mine, site of the Du Pont operation, about 400 carloads of sand have to be mined each day to yield five carloads of usable ore.

It has taken the company two years to reach its production goal, owing to various difficulties that had to be surmounted.

One of these obstacles was that roots and trunks of trees, the remains of an ancient forest, covered up thousands of years ago by shifting terrain, were sucked up by the dredge, causing costly breakdowns.

At present the Trail Ridge mine is being operated twenty-four hours a day, seven days a week. Even at this rate of removal there is estimated to be enough ilmenite for another 12 to 14 years.



MILLION-DOLLAR LOSS resulted last week from an explosion and fire at Arizona Chemical Co.'s Panama City, Fla., plant. The blast occurred at 4 a.m. (May 4); and since few were working on that shift, there were only three fatalities. The pinene plant was destroyed, but effective fire-fighting saved the new tall oil unit and the adjacent International Paper Co. plant from which Arizona draws its raw materials. Cause of the explosion was undetermined this week.

Ceilings Scored

The price freeze, a blanket over industry to keep prices from rising, is making businessmen hot under the collar (CIW, May 5, 1951). Dozens of different chemical industries have asked the Office of Price Stabilization for a tailor-made price regulation in preference to the general price freeze.

Among recent petitioners are the Lake States pulpwood manufacturers. They suggest the old OPA Regulation No. 257, which fixed dollars-and-cents ceilings for pulpwood, as a logical pattern for a new regulation.

The anti-freeze makers held several meetings with OPS officials to discuss proposed tailor-made regulations but did not suggest exact ceiling prices for anti-freeze.

The cosmetics and toiletries manufacturers told OPS officials that they want to have a tailor-made price regulation similar to the old OPA regulation 393. Industry representatives pointed out the need of special provisions to accommodate the customary pricing practices in the cosmetic trade. Brand products are always sold by manufacturers against fixed retail prices, mostly covered by state fair trade laws.

Members of the Pharmaceutical Drugs Manufacturers Industry Advisory Committee recommended that their industry remain under the General Ceiling Price Regulation until a suitable special tailor-made regulation can be drafted.

They told OPS officials at their first meeting that because of the pricing methods in their fields, and the pattern of their cost increases, the GCPR was more practical and desirable for their industry than the forthcoming General Manufacturers Regulation.

OPS officials are finding that this is a big country and it has a lot of different industries. And, it is practically impossible to regulate some of them through any shotgun-character price control.

Experimental chemicals, new chemicals sold in small volume, chemicals employed for certain laboratory purposes, hog cholera virus and anti-hog cholera serum were exempted from price controls, effective April 16.

All of these commodities represent items insignificant to the cost of living or defense, and enforcement difficulties would be out of proportion to any economic advantage derived. The exemption of hog cholera virus and anti-hog cholera serum was requested by the Secretary of Agriculture.

The regulation also exempts reagent chemicals, laboratory reagent specialty solutions and prepared culture media when sold for scientific or medical research, for analytical and educational uses and for quality control of industrial products.

FOREIGN . . . . .

Russia: The latest issue of a newsletter published by Baltic refugees throws light on the drug situation in Latvia. The publication reports that Professor Arveds Kalninsh, laureate of the Stalin premium, said:

"In England, only 8 consumptive patients are being treated with anti-tuberculosis agents (he did not specify). In our country, however, it has been manufactured in great quantities since 1948. The USSR will march in the forefront of the world in the struggle against consumption. Our factory, which was awarded a premium, is also contributing in this direction. The USSR minister for public health, Smirnow, is taking a personal interest in our work."

The newsletter pointed out that the report does not square with the facts. As late as 1950, persons working in pharmacies in Esthonia and Latvia wrote to friends and relatives both in Sweden and England, requesting penicillin, streptomycin, and aureomycin. The letters were written as personal appeals for the use of the writers, but the requests were for unusually large quantities—2 or 3 kilograms. The obvious conclusion: The letters were written under compulsion to supply the pharmacies which employed the writers.

A serious shortage of drugs is reported from the satellite countries as well. All refugees from Poland, for example, say that anti-biotics can be obtained only in the black market . . . if at all.

EXPANSION . . . .

American Cyanamid: The company has executed its option to purchase 2000 acres of land from the Clinchfield Coal Corp., in Russel County, Va. Clinchfield President A. R. Matthews says Cyanamid has the right to lease additional coal lands in the vicinity. Cyanamid officials are close-mouthed about plans, say only that they "are considering exploiting the coal resources there for the production of chemicals."

Celanese: A formal intent to buy a 450-acre tract in W. Va. has been issued by Celanese. The land is located at Gallipolis Ferry, on the Ohio River, 5 mi. south of Pt. Pleasant. Celanese also refuses to disclose production plans or construction schedule.

Heyden: A new plant at the Fords, N. J., Division will produce parachloro-benzaldehyde. The plant marks a step in the moving from pilot to commercial production of the compound.

Sun Oil: Plans are in progress at the Marcus Hook (Pa.) refinery for the construction of benzene-toluene facilities. Expansion will entail an expenditure of $8,380,000. In addition, the company will spend $2,577,145 on the construction of aviation gasoline facilities there.

Carborundum: Despite the issuance of certificates of necessity by NPA, Carborundum has temporarily abandoned plans for building an aluminum oxide plant at Calvert City, Ky. The company explains its action by stating that the certificate provided for only a 50% write-off within 5 years and, on that basis, the plant would not be practical there. It says the only reason for building a plant so far from the home base at Niagara Falls was the desire to comply with the government's policy for dispersing plants. And 50% amortisation, says Carborundum, would not justify the additional expense involved in a Kentucky plant.

Pfizer: A Canadian subsidiary, Pfizer Canada, Ltd., has been formed to handle the sale of terramycin and other company products.

KEY CHANGES . .

E. T. Asplundh: From vice president to president, Southern Alkali Corp.

Leland Hazard: To vice president and general counsel, Southern Alkali.

W. I. Galliher: To vice president, Southern Alkali.

Richard B. Tucker: To director, Southern Alkali.

E. D. Griffin: To director, Southern Alkali.

George O. Curme: From vice president in charge of chemical research to vice president in charge of research for Union Carbide and Carbon Corp.

Robert J. Racine: To manager, industrial sales, Wyandotte Chemicals.

Fred C. Hanker: To assistant to the president, Catalytic Construction Co.

F. B. Patton: To general manager, Armour's Chemical Division.

Paul W. Leppla: To technical director, Dicalite Division, Great Lakes Carbon.

John K. Nevin: To purchasing agent, Smith, Kline & French Laboratories.

Brownlee O. Currey: To member of board, Commercial Solvents.

C. L. Dickinson: From process control manager, Diamond Alkali's Deer Park plant, to manager of plant engineering at Kolker Chemical's plant, Greens Bayou.

C. A. Hill: From manager, Firestone's Lake Charles plant, to general manager, Synthetic Rubber Division.

George C. Sheldon: To sales manager, American Resinous Chemicals Corp.

Inquire first of **Baker** if you need

ELECTRONIC TUBE CHEMICALS

to a defined purity in TONNAGE lots

...for defense needs

...for civilian needs

National defense needs are multiplying the problems of many companies who are in need of *tonnage* chemicals to exacting specifications.

Particularly in demand are chemicals required for electronic purposes.

If you need such chemicals—either for defense or for civilian use, or for both—inquire first of Baker. Baker is adjusting its facilities to meet emergency needs, and can supply you with tonnage chemicals to known standards of purity. We will also be glad to discuss, in confidence, your requirements for tonnage chemicals to your own exacting specifications.

Baker has long been trained in the art of exactness. It has, for many years, supplied chemicals to a defined purity "by the ton." We invite you to call upon Baker—and to depend upon Baker as a reliable source of supply.

J. T. Baker Chemical Co., *Executive Offices and Plant,* Phillipsburg, New Jersey.

A few Baker ELECTRONIC CHEMICALS

Baker R500
(a prepared cathode spray)
Barium Acetate
Barium Carbonate
Barium Nitrate
Cadmium Salts
Strontium Carbonate
Strontium Nitrate
Triple Carbonates

Baker CHEMICAL

Baker Chemicals

REAGENT • FINE • INDUSTRIAL

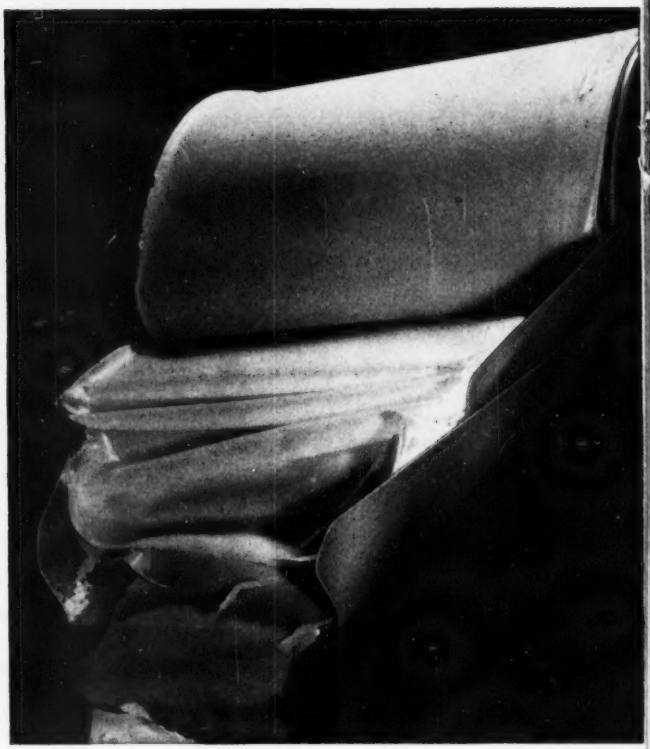
MYVEROL®

DISTILLED MONOGLYCERIDES

odor-free • catalyst-free • soap-free

● The 90% monoester content of these products, achieved by molecular distillation, can lead to profitable improvements in appearance, texture, and stability of many food and pharmaceutical products.

Available as: *Type 18-85*, a plastic fat made from refined cottonseed oil; *Type 18-40*, a firm fat made from prime steam-rendered lard; *Type 18-00*, a flaked solid glyceryl monostearate made from hydrogenated lard. For estimates on delivery dates in quantities from drums to carloads, and for information on distilled monoglycerides from other fats—communicate with ***Distillation Products Industries,*** 789 Ridge Road West, Rochester 3, N. Y. (Division of Eastman Kodak Company). Sales offices: 570 Lexington Avenue, New York 22, N. Y. • 919 North Michigan Ave., Chicago 11, Ill. • Gillies & Loughlin, Los Angeles and San Francisco • Charles Albert Smith, Ltd., Montreal and Toronto.



DPi

distillers of monoglycerides from natural fats and oils

Also...vitamins A and E...high vacuum equipment...more than 3400 Eastman Organic Chemicals for science and industry

DU PONT'S RESEARCH DIRECTORS*: The soundest kind of insurance.

"More Important... Than to Pay Dividends"

Completion of Du Pont's $30 million expansion at its Experimental Station points up the prominence accorded to research by the firm.

Last year Du Pont spent $38 million (excluding construction)—over 3% of gross sales—on research; in 1939 it spent only $7 million.

The future holds bigger figures in store, for it is conscious company policy to create new products for new markets, rather than merely to wage the less profitable battle for higher sales of established commodities.

Back in 1932, Chemical Director Elmer K. Bolton, trimming his sail to the hurricane winds of the Great Depression, allowed his research staff to dwindle as men were transferred to other Du Pont departments. President Lammot Du Pont, upon learning that Bolton was not seeking to replace them, said, "You know it is more important to carry out research than to pay dividends."

The Du Pont Co. happily has not been confronted with that choice, for dividends have certainly kept pace with increased research expenditures; but that basic philosophy was nevertheless evident this week as 380 industrial and academic V.I.P.'s detrained at Wilmington's ancient Pennsylvania Station and sped in waiting cabs to hear and see what $30 million had bought.

It had bought, for the Experimental Station, nine new laboratories, ten service buildings and substantial enlargement of two older laboratories. More than that, however, it had bought assurance—in so far as physical equipment can assure—of a more solid research base for a company whose chief stock in trade is the fruits of research.

Innovation is Role: For Du Pont has defined its role in the chemical industry as innovation. Young (48), research-minded President Crawford H. Greenewalt made that clear when he said, "Exploiting to the full the new developments produced in our research laboratories . . . is our greatest contribution and our greatest responsibility. Any success we might have in striving for the largest possible volume in viscose rayon, in paint, or in sulfuric acid might very probably make us miss a neoprene synthetic rubber, a cellophane, or a nylon. . . ."

Du Pont never tires of pointing out that three-fifths of its sales are made up of research-born products that were commercially unknown twenty years ago, and the company's deliberate policy, as expressed by Greenewalt, augurs for maintenance of that ratio.

Organization for Results: Sufficient capital—to provide $33,000 investment for each technical researcher—is only one ingredient in successful research. Others are brains and able guidance.

Brains are avidly sought, for Bol-

* Here in a Rayon Department laboratory Physicist Jack Ballou (shirtsleeves) explains use of equipment to Lawton Burrows (Explosives); Max Goebel (Grasselli Chemicals); George Graves (Fabrics and Finishes); John Beekley (Polychemicals); Winfield Heckert (Rayon); Thomas Chilton (Engineering); Frank Signaigo (Photo Products); John Brill (Film); John Foulger (Service); Paul Austin (Electrochemicals); James Booge (Pigments); Merlin Brubaker (Chemical); Harold Elley (Organic Chemicals).

HAVE YOU FULLY EXPLORED

THE VERSATILE ANTAROXES*?

NEW uses, new applications for the Antaroxes—the non-ionic Antara surfactants—are being established almost every day. Their excellent wetting, dispersing, emulsifying, detergent and general surface-active properties make them useful in many fields. Here are a few surfactant applications where members of the Antarox family may prove of value . . .

AGRICULTURAL INSECTICIDES & HERBICIDES The success of these new materials for making stable emulsions and dispersions of the new insecticides and herbicides is outstanding. They help suspend insecticide or herbicide powder in the spray liquid, then make the liquid spread on the foliage, greatly increasing effectiveness.

CHEMICAL PROCESSING — Surface-active agents emulsify mineral oils, insecticides, cutting and quenching oils, are particularly useful when emulsions must be acid-stable. They act as plasticizers and binders for waxes, rubber, ceramics, yeast cakes, cosmetics, polishes.

COMPOUNDED DETERGENTS—Powder, paste and liquid preparations for use in home and industry have increased manyfold with the aid of synthetics due to their more efficient cleansing, particularly in hard water areas.

DAIRY—Nontoxic, odorless, and fast-acting, synthetic detergents reduce formation of milkstone, act as germicidal agents, rinse better than soap. In bottle washing, they eliminate scum, act as lubricant to reduce scuffing of bottles, lengthen their life.

DRUGS & COSMETICS—Cream-type lotions owe their existence to synthetic emulsifiers; synthetics are especially useful when lotions contain fruit juices, require acid-stable additives. Shampoos use these materials, as do many pharmaceutical products.

FOODS—Sandless spinach is obtained by new wetting agents that make it easier to remove dirt. Also used for washing fruits free of insecticides. Still under experiment is use in fruit-peeling, where synthetic materials are combined with alkalis to produce a compound that lifts off skins, removes a minimum of fruit.

LEATHER—Surface-active agents aid in pickling, tanning, and fat-liquoring, greatly reduce wetting time for dried hides and skins by dispersing protein compounds and aiding penetration of liquids. They help in grease removal, permit acid scouring of fleeces.

LUBRICATION—In lubricants, the new synthetics act as pour-point depressants, emulsifiers, wetting agents. They help in wire drawing, stamping, and rolling of metals. Where cleaning as well as lubrication is necessary, a single synthetic may do the work of two other compounds.

METAL CLEANING — Almost every type of metal cleaning can use surface-active agents. They reduce cleaning time and concentration of alkali required, prevent formation of scum, assure better contact between metal and metal-treatment solutions used in later operations.

METAL WORKING — Emulsifiers improve cutting and quenching oils; wetting agents act as buffing assistants, promote spreading of soldering fluxes. Some go into wire drawing and metal rolling lubricants.

PAINTS, DYES & INKS—Wetting agents aid in grinding, facilitate pigment dispersion, reduce viscosity, promote penetration of ink into paper, spreading of paint on surfaces. They also help in paint, dye and ink removal where their action is similar to detergency (cleaning).

PAPER — Synthetic detergents and wetting agents are used in conditioning and scouring felts, as pitch-dispersing agents, as dye-levelers. They are also used to increase flexibility and absorbency of paper towels and blotters.

PETROLEUM — Hydrochloric-acid solutions used to reopen oil wells (by dissolving limestone which blocks oil flow) penetrate better, act faster, when surface-active agents are added. Petroleum industry can also use them as de-emulsifiers, polymerization agents, lubricants, emulsifiers.

PLASTICS—Synthetics promote penetration of impregnating compounds. As an ingredient of plastic-resin adhesives, they increase stability and promote bonding action. In addition, they act as mold lubricants and assure more uniform dispersion of fillers and pigments.

POLISHES & WAXES — As in cosmetics, cream-type furniture, floor, automobile and shoe polishes (oil in water emulsions) owe much of their growth to synthetic emulsifiers. In materials like these, synthetics make up only 5 to 10% of compound, but have big effect on performance.

RUBBER—Wetting agents prevent adhesion in milling operations, help insure uniform dispersion of carbon black and other fillers, improve penetration and spreading of coating and impregnation compounds, help stabilize latex, are foaming agents for sponge rubber.

TEXTILES—Surface-active agents follow textiles from the carding room all the way to the laundry. In spinning they're emulsifiers, antistatic additives, spreading agents. They help in sizing, scouring, dyeing, finishing and have many other uses.

WATER PAINTS — Surfactants with emulsifying and dispersing properties are useful for making emulsion paint compositions.

AND IN MANY OTHER FIELDS — such as building materials, ceramics and glass, filtering, fire extinguishing, lumber and wood products, mining, plant cleaning and rug and upholstery cleaning.

* * *

Extensive research staffs and facilities support the development and application of all Antara Products — available to work with you in the improvement of an existing product or the development of a new one. Your inquiry is invited—without obligation. It will bring a prompt opinion as to whether one of the Antara Products may be adaptable to your needs. Kindly address your inquiry to Department 56.

*"ANTAROX" — Reg. U.S. Pat. Off.

ANTARA® PRODUCTS

DIVISION OF

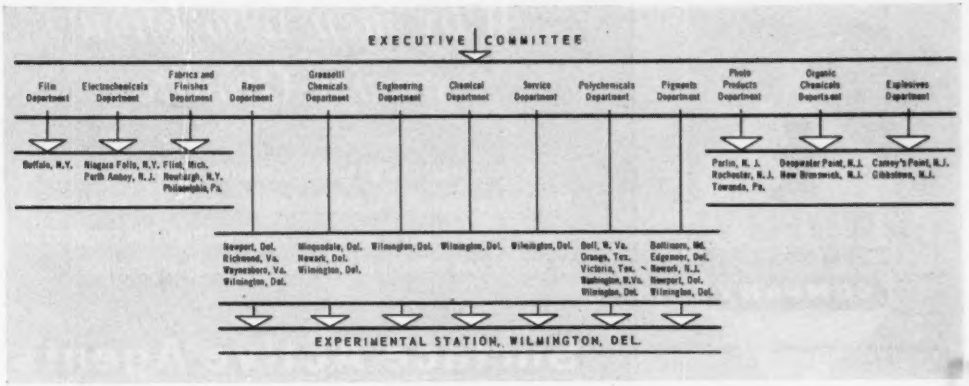
GENERAL DYESTUFF CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

BRANCHES

Boston • Providence • Philadelphia • Charlotte, N. C. • Chicago • Portland, Ore. • San Francisco

In Canada: Chemical Developments of Canada Limited, Leaside, Toronto 17



RESEARCH ORGANIZATION: A providential mixture of direction and autonomy.

ton likes to quote Chemist-Educator James B. Conant*: "Ten second-rate men are no substitute for one first-class man." Hardly a single promising chemistry or engineering senior in a recognized college has failed to see "the Du Pont man" as he makes his appointed rounds to scout prospective employees. Other companies sometimes pay their novices more, but Du Pont's personnel policies are liberal enough, and opportunities for advancement are abundant enough, to attract many outstanding men to its research staffs.

Among the worthwhile incentives are the bonus plans. The "A" bonus is granted for conspicuous service of any nature, regardless of company profits. Last year Du Pont awarded $400,794 to 195 employees. The "B" bonus is given for general contributions—ability, efficiency and loyalty—to the firm's welfare, and the total amount depends on a formula which involves company earnings. This year $26,774,200 was earmarked for 5,908 workers, based on last year's profits.

But is is the third ingredient—able guidance—that has probably contributed most to Du Pont's research achievements. Perhaps "guidance" isn't the word, for the research organization is a curious blend of planning and planlessness, of direction and autonomy.

There is no over-all research director, or vice-president in charge of research. Highest-ranking research man is Roger Williams, vice-president, director, and member of the all-powerful Executive Committee. He is advisor on research and development but has no direct authority over those functions. Bolton is head of the Chemical Department and is responsible for its research—which is largely fundamental and long-range in nature. The Chemical Department is not affiliated with any of the manufacturing departments, and Bolton thus reports directly to the Executive Committee.

The ten manufacturing departments and three auxiliary departments all carry out independent research, and each departmental research director (*see illustration*) is responsible only to his department manager. Projects costing up to $100,000 in capital can be started without prior approval of the Executive Committee. The manufacturing departments—whose research projects are usually shorter-range for early application—get the bulk of Du Pont's research dollars.

The same balance between direction and autonomy holds all the way down to the chemist in the lab. He is urged and expected to spend a portion of his time—up to 20%—on his own bright ideas.

Dispersal of authority is matched by dispersal of laboratories. The expansion at Wilmington has been augmented by enlarged facilities at several of the 31 laboratories outside of Wilmington. (They're scattered among 26 cities in 9 states.) Thus the expansion at Wilmington is in no sense a centralization.

Five Thousand: Throughout Du Pont's laboratories, 5,000 people (1,800 of them technically trained) are engaged in research.* About 2,300 of the total (800 technical personnel) are at the Experimental Station.

Among themselves they obtained 390 patents last year, of which over half, significantly, were in the field of high polymers alone. (Greenewalt, incidentally, has his name on patents—and at Du Pont that means he actually did the work.) Du Pont men last year also authored over a hundred papers in various technical journals.

Although research under the various departments is autonomous, the research directors meet regularly every month to compare notes and discuss problems. Besides, the Chemical Department—since it is charged with general research—serves as an informal clearing house to suggest, assist, and prevent undesirable duplication of effort.

Aiding in this effort is an extensive library set-up embracing 125,000 books and bound journal volumes, 65,000 pamphlets and bulletins, almost 3,700 current technical periodicals and thousands of patents. Frequent seminars—usually conducted by Du Pont's own consultants and research men—keep researchers up-to-date on scientific activities.

Much of this welter of activity yields nothing, in the end, but red ink. Only one project in twenty ever makes a cent; and in terms of dollars, only one in five pays off. Over $30 million of last year's budget may thus go down the drain, but the remaining $7-odd million—if past experience is a guide—will turn enough profit to cancel the unlucky guesses and still pay dividends.

Twenty-Five Fold: Best proof of that is the rate at which Du Pont's research expenditures have ballooned. Although the company is reticent about a breakdown (it doesn't quote research costs in its reports as do many companies), some figures can be gleaned from off-hand comments: In 1920 they were $1.5 million; in 1939 the company proudly advertised to New York's World's Fair visitors

* Who also spoke at this week's dedicatory ceremonies.

* Also over 50 prominent consultants are retained, regularly advise on research.

that it was spending $7 million; the figure had climbed—by ex-President Carpenter's admission—to about $16 million in 1945; and last year's $38 million* is twenty-five times as great as 1920's. If there were a sounder kind of insurance on the company's future, there's no doubt that Du Pont's canny Finance Committee would have discovered it.

Triazine Dividend

Commercial production of cyanuric chloride, after two years of pilot output, should spark development of its many potential industrial applications. Currently getting a foothold in the manufacture of dyes and pharmaceuticals, the compound's unique chemistry lends itself to the synthesis of a variety of useful heterocyclic products.

The triazine ring is responsible for much of the characteristic chemical behavior of cyanuric chloride. This six-membered, nitrogen-containing structure will act as a condensing agent to join together many different types of intermediates. Acid halides and anhydrides are conventional reagents for this job—phosgene is perhaps the most common—but the triazine ring surpasses them in range of application and diversity of products.*

Characteristic triazine behavior has been put to good use in the preparation of scores of new dyestuffs. A unique feature of these products is the strong affinity they exhibit for vegetable fibers. In many cases, colorless intermediates linked to the triazine nucleus can be affixed to the fiber, then converted to a dye by diazo development or diazotization and coupling. New and unusual molecular combinations may be achieved in this way, with surprising results.

One unusual compound, a condensation product of cyanuric chloride, ammonia, and aminoanthraquinone, apparently has the unique ability to color electrolytic oxide films on aluminum.

Insecticides to Explosives: Cyanuric chloride condensed with long-chain amines gives substances with marked surface activity. It is also used in the preparation of Blankophor white dyes, used as optical bleaching agents in laundering and paper manufacture. The reaction product of cyanuric chloride and toloxymetanilic acid is the basis for several insecticides and mothproofing agents; condensation with aromatic sulfonated amido amines gives substances proposed as leather tanning agents. Cyanuric triazide, a highly powerful explosive, is made by reacting cyanuric chloride with sodium azide.

Drugs active against spirochetes and trypanosomes have been prepared from cyanuric chloride and arsanilic acid. A number of rubber-processing chemicals have been based on cyanuric chloride, but as yet they have not found any commercial acceptance in this country. Triethylene melamine (from cyanuric chloride and ethylene imine), used by the Germans to reduce water absorption of regenerated cellulose, is another derivative that has as yet received little attention in the U. S.

A colorless, crystalline solid, cyanuric chloride is easily hydrolyzed by water, but stable in the anhydrous state. It is easily soluble in acetic acid, ether, heptane, and acetonitrile, but sparingly soluble in benzene, acetone, chloroform, and nitrobenzene. Below 10 C, the compound is almost insoluble in water; above this temperature, hydrolysis is rapid.

The product was developed in the laboratories of the American Cyanamid Co. in the mid 1940's, reaching the pilot-plant in 1949. Now in the infancy of commercial production at Cyanamid's Warners (N. J.) plant, cyanuric chloride sells for $2.75 a pound in 100 lb. drums and $4.00 in-less-than drum quantities.

* Mentioned in the 1950 report, it is probably the first research figure officially published.

* Due to the fact that three different molecules may be condensed through a triazine ring.

ARTILLERYMEN IN ITALY: Burlap gave way to fiber glass in snowy locales.

Colorful Cover-Up

During the early weeks of the Korean fighting, our troops used straw to camouflage artillery and equipment; burlap, the army's old standby came next. But today, research going full steam at the Engineer Research and Development Laboratories, Fort Belvoir, Va., is aimed at the development of plastics to do the job on a more scientific basis.

If army engineers have their way, burlap—despite its long and faithful service—will soon be mustered out. Not that it hasn't done its job. Burlap is cheap and durable. It has a low gloss that improves with age, and its rough weave produces an excellent texture.

Unfortunately, burlap is heavy and bulky. It absorbs water, making it even heavier, and will soak up gasoline and oil to become a fire hazard. Moreover, burlap's great popularity in a large number of military and civilian uses, will undoubtedly limit its availability for camouflage purposes.

Army researchers will not be content with mere substitutes. They want replacements possessing all the assets of burlap—with none of its deficiencies. A large order, but not impossible. As a matter of fact, a plastic material has been developed* that almost fills the bill. However, certain important obstacles must still be overcome.

But if the army is having its troubles, they are no less than those of civilian manufacturers in on the project. Chief difficulty is toning down glossy plastics to produce a surface, diffusing enough for camouflage purposes. Researchers have tried to emboss the plastics and flock them with cotton and rayon fibers. Results were discouraging; the plastics retained their objectionable sheen and smooth surface. Efforts are now being directed towards creping and coating with different compounds. Although the appearance characteristics produced by the new treatments have not been fully evaluated, there is evidence that the right line of attack has been found.

Fiber glass For Snow: When a satisfactory material has been developed, it will see service as garnishing on camouflage nets. Generally camouflage with garnishing interwoven, is colored to resemble common terrain; olive-green, brown, and tan are most common colors. During World War

* Defense Dep't. does not see fit to disclose further details at this time.

II, white strands of fiberglass were found effective in the mountains of Italy and other snowy locales.

Prior to World War II, camouflage was considered exclusively in the artist's domain. But with the introduction of new aerial photographic techniques and the use of selected filters, a more scientific approach became necessary. Perceptual match, depending chiefly upon skillful blending of colors, took a back seat. The ideal camouflage material required colors that not only matched those of the background, but also had an identical spectral reflectance curve. Infra-red photography forced an extension of spectral analysis beyond the visible range. Modern techniques must account for both the visible and invisible wavelengths; preparation of specifications for serviceable camouflage materials presents knotty problems in color chemistry.

Control For Color-Analysis: To cope with these problems, the Fort Belvoir installations have the best in up-to-date equipment and know-how. Its special Perception Laboratory is a prime example of rigorous control down to the last detail. This lab—housing the color-analysis instruments—is a long rectangular room, about 12 by 30 feet. A subdued gray, the lab is naturally illuminated throughout by means of Macbeth skylights that provide maximum light intensity of 100 foot-candles at desk height. Moreover, color temperature is maintained at 7500 degrees Kelvin, during working hours.

Color research at the Engineer Research and Development Labs is almost entirely limited to applied problems. Researchers' efforts to develop scientifically-sound camouflage is ultimately designed to supplement the Army mule's kick with an equal measure of cunning.

Halogen Gift

Three new Westvaco chemicals have a potential market as solvents, and organic intermediates for the synthesis of many commercial products. Now available for laboratory investigation, the products could be produced in substantial lots, on relatively short notice.

The group—consisting of ethylene chlorobromide, dichloroacetaldehyde, and trichloroethanol—makes good use of its halogen atoms to facilitate a number of useful chemical reactions.

Ethylene chlorobromide, for example, has a bromine which is far more easily replaced than its chlorine. Bromine is preferentially replaced by many reagents to give chlorinated products which may be useful stepping stones to higher organic structures. Cyanide reacts with ethylene chlorobromide, yielding chloropropionitrile; reaction with bisulfite yields an analogous substitution product.

In addition to its application in synthesis, ethylene chlorobromide looks promising as a soil fumigant, and should see some service as a solvent. Its possibilities as a monomer are also worth considering.

Chlorine Activates: Presence of two chlorine atoms adjacent to an aldehyde group in dichloroacetaldehyde, imparts a more-than-usual degree of reactivity to the carbonyl function. The compound may thus be used to: introduce a dichloroethylidene, or the $CHCl_2CHOH$ group; form dichloroethanol and dichloroacetic acid; synthesize substituted 1,3-benzodioxans, glyoxal derivatives, and dichloro analogs of DDT.

Trichloroethanol behaves primarily like a typical primary alcohol, but it will show weakly acidic properties under proper conditions. Offering a handy method of introducing a trichoromethyl group into an organic molecule, the compound should be valuable in the synthesis of a number of pharmaceuticals containing this radical. Preliminary investigation points up a further use for trichloroethanol in flameproofing preparations.

Plant growth-regulators have been produced by esterification with trichoroethanol, and several interesting lubricating oil-additives have been synthesized from the halogenated alcohol. Furthermore, trichloroethanol is useful in altering plasticizers to improve compatibility with chlorinated resins.

All three of Westvaco's halogenated intermediates are colorless liquids, soluble in the common organics. Toxicity is an important handling consideration—care must be exercised to prevent inhalation of fumes and skin contact.

•

White Leather: According to American Cyanamid researchers, melamine plastic tanning agents produce a white leather that will not darken with age or exposure to sunlight. White leathers, tanned with formaldehyde, yellow with age; chrome-tanned leathers, bleached to give a white surface, retain a dark interior. Leathers tanned with melamine resins are white through-and-through.

•

Penicillin O: A new penicillin, differing from penicillin G by an allylmercaptomethyl group in place of the latter's benzyl, is the result of research at Upjohn Co. Spectrum of antibacterial activity the O compound is similar to that of the G, but allergenicity is considerably less. Clinical studies have shown that a large majority of G-sensitive patients are not allergic to the new penicillin O.

•

Blood Plasmas: Stanford Medical School is launching a research program to develop and appraise a number of materials as blood plasma substitutes. The project is based on a research contract issued by the Office of Naval Research.

•

Xenon Anaesthetic: The rare gas, xenon, has been used as a surgical anaesthetic at the State University of Iowa hospital. Advantage: It is non-flamable. The gas used in the test work was supplied by Linde Air Products Co. Currently, the relatively high cost of the gas limits its field of application.

•

Citrus Fungicide: Allyl carbanilate, in the form of alcoholic solution or aqueous emulsion, is cited by Monsanto in a recent patent (2,537,690) as preventing the growth of fungi on the surface of citrus fruits. Major potential: in shipment and storage of such fruit.

•

Dilinoleic Acid: Emery Industries, which has been marketing experimental quantities of dilinoleic acid for the past two years, is moving the item up to commercial scale.

It is liquid, viscous, has an apparent molecular weight of about 600. Other features: Heat stable, undergoes carboxyl group reactions typical of a monomeric acid. Moreover, its polyfunctional nature allows polymerization, resinification, reaction with polyalcohols, polyamines, polyvalent metals.

One major market is as a bodying agent in surface coatings, a partial replacement for scarce drying oils.

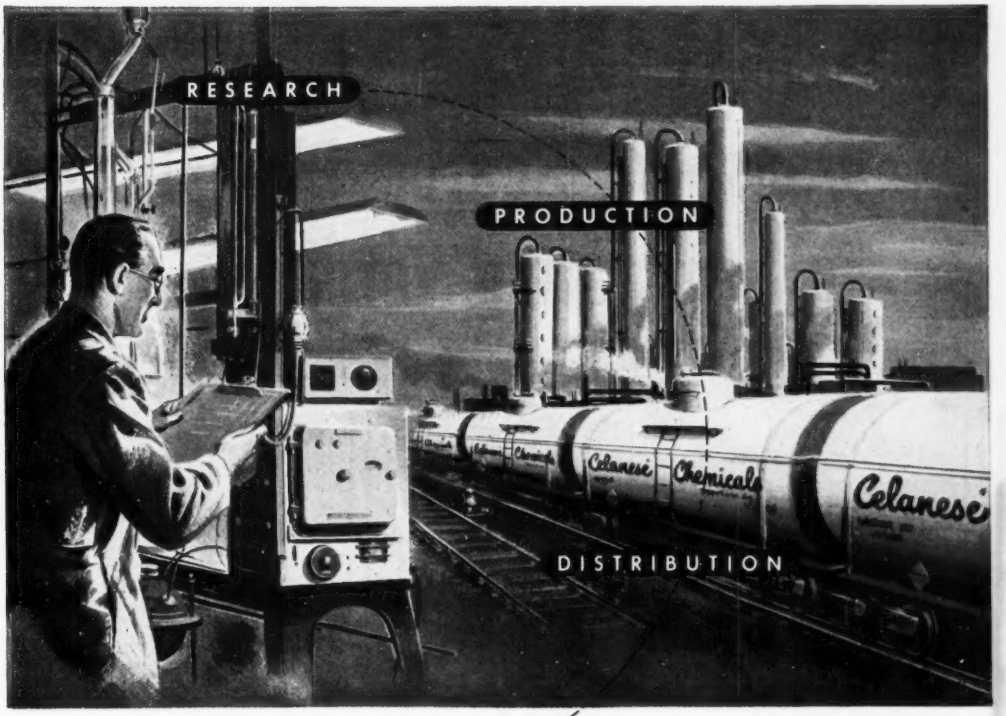
•

Trichlorobenzene: Pennsylvania Salt Manufacturing Co. is pilot-planting trichlorobenzene, offering the chemical in limited quantities.

The chlorinated benezene is used mainly as an ingredient in compounded transformer oils, as a solvent (oils, fats, waxes, resins, oil-soluble dyes). It is also employed as a dye intermediate, a heat transfer medium, a toxicant in the control of termites.

•

Crude Saponin: A crude grade of saponin is now being introduced by B. L. Lemke & Co. Main uses: as a wetting and foaming agent.



Chemical Formula

FOR PEAK PRODUCTION

Round-the-clock plant operation is back in style as American industry, called upon for greater output than ever before, is pushing production to new highs.

To meet the steadily increasing defense demands of industry for organic chemicals, the Celanese plant at Bishop, Texas is in continuous operation. Celanese, a major producer of Formaldehyde, Acetic Acid, Acetone, Methanol and other organic chemicals, is shipping volume quantities of these organics to the plastics, protective coatings, textile, paint and other vital industries.

Celanese chemical service to industry includes: the most up-to-date production methods . . . a nation-wide distribution system . . . and a far-reaching program of research and development backed by a generation of experience in petroleum chemistry.

Celanese Corporation of America, Chemical Division, Dept. 502-E, 180 Madison Avenue, New York 16, N. Y.

Celanese* **CHEMICALS**

*Reg. U.S. Pat. Off.

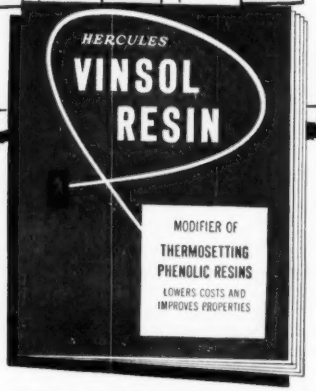
PARAFORMALDEHYDE • FORMALDEHYDE • ACETALDEHYDE • ACETIC ACID • ACETONE
BUTYL ALCOHOLS • METHANOL • n-PROPANOL • METHYLAL • TRICRESYL PHOSPHATES
BUTYLENE GLYCOLS • DI-PROPYLENE GLYCOL • PROPYLENE GLYCOL • PROPYLENE OXIDE

PROOF THAT VINSOL® RESIN CAN

Conserve Scarce Phenolics in Laminating Varnish!

	With Phenolic	With "Vinsol"	With Phenolic	With "Vinsol"	With Phenolic	With "Vinsol"	With Phenolic	With "Vinsol"
Impregnating Solutions								
Phenolic Resin (Based on Solids)	100	50	100	50	100	50	100	50
Vinsol (Based on Solids)	-	50	-	50	-	50	-	50
pH	7.75	6.6	7.75	6.6	7.75	6.6	7.75	6.6
Impregnated Paper								
Drying Time (Minutes at 105°C.)	10	10	10	10	10	10	10	10
Pressing Time (Minutes)	20	20	20	20	20	20	20	20
Pressure (p.s.i.)	1500	1500	1000	1000	750	750	1000	1000
Temperature (°F.) *	350	350	350	350	350	350	275	275
Properties of Cured Kraft Paper Laminate								
Percent Resin Content	49.7	49.3	50.4	50.4	48.8	50.6	48.7	49.8
Flexural Strength (p.s.i.)	18,500	18,300	18,500	16,900	16,300	17,000	16,900	18,900
Flexural Modulus (p.s.i.)	850,000	910,000	870,000	873,000	710,000	760,000	790,000	920,000
Angle of Bend (Degrees)	17	16	16	15	15	17	15	19
Rockwell Hardness (M Scale)	106	114	103	112	64	109	91	115
Specific Gravity	1.31	1.38	1.31	1.37	1.20	1.34	1.28	1.38
Percent Volatile	.76	.32	.66	.32	.95	.31	.70	.20
Percent Water Absorption (24 Hours)**	3.9	3.3	3.3	3.1	8.4	3.4	6.1	3.3
Percent Acetone Extractable	.2	9.9	.3	10.4	.2	11.0	.3	14.6

* Cooled in press.
** Water absorption samples 1/16 inch thick.
Note: All formulations are given as parts by weight.



THIS TABLE shows comparative values of paper laminates in which one of the impregnating solutions was a commercial phenolic varnish and the other a "Vinsol" modification of the commercial phenolic varnish. Any losses in end properties are negligible. "Vinsol" has even improved physical characteristics in some instances. These results are typical of many investigations conducted by Hercules on laminating and other phenolic formulations.

Today, especially, it will pay you to evaluate "Vinsol" as a phenolic extender or modifier. Priced at less than 5¢ per pound, this dark-colored, high-melting thermoplastic offers substantial savings in total resin costs. Send for generous testing sample.

FREE 16-PAGE BOOKLET

The table shown above is reproduced from this new Hercules booklet. It is one of many which indicate the opportunities that "Vinsol" Resin offers in conserving phenolics. Write for your copy of this helpful booklet. We will be glad to provide specific technical advice if you'll tell us where you think "Vinsol" could conserve your phenolic supply.

HERCULES POWDER COMPANY Naval Stores Department, 992 Market Street, Wilmington, Delaware

NV51-2R

Measurement of Nothing

New high vacuum gauge, more accurate and readily calibrated than present types, has been developed by the National Bureau of Standards.

Pressure changes are measured by a movable diaphram . . . contamination problems are eliminated.

High vacuum processing techniques entail the measurement of low pressures . . . but accurately. For this reason many production men were studying reports this week of a new type gauge developed by the National Bureau of Standards and now being manufactured by Clark Instrument Co.

The new instrument, which is described by its developers as a diaphragm-type micromanometer, may turn out to be an interesting competitor for some of the present types of high vacuum gauges. It was originally designed for the measurement and control of pressure in mass spectrometers, which are being used in many different applications for product analysis and process control. But the new gauge's capabilities may enable it to handle other chores.

Other jobs: Already, many production engineers are eyeing it for use in the measurement and control of high vacuums in such operations as molecular distillation, and the dehydration of such heat sensitive materials.

The new micromanometer covers about the same range of pressures as the Pirani, McLeod and Alphatron gauges. Though more costly, it does avoid the problem of contaminants involved in the use of the McLeod gauge. It is also more simply and accurately calibrated than either the Pirani or Alphatron gauges.

Diaphragm does it: The micromanometer gives pressure readings (1-100 microns) which depend only upon the movement of a not-easy-to-go-wrong diaphragm. In fact, it has some of the main earmarks of the absolute gauge: its readings are not affected by the composition of the gas being tested, and, there is no danger of contaminating the system under vacuum with mercury or oil vapor. .

Construction: The pressure cell containing the diaphragm is the heart of the instrument. The diaphragm itself, which is very thin and corrugated, covers a slightly dished brass disk to which it is sealed at the periphery. A very high vacuum (approximately 1/100 of the pressure to be measured) is drawn on one side of this diaphragm, while the other side is exposed to the vacuum to be measured. The difference in pressures controls the position of the separating diaphragm, which is measured electrically.

Transformer used: Diaphragm position is measured by making the diaphragm itself a coupling between the primary and secondary windings of a radio-frequency (RF) transformer. A second RF transformer with a fixed coupling has an identical current in its primary coil. But it balances the fixed voltage in its secondary electrically against the variable voltage of the diaphragm containing transformer. By this means the difference in voltages induced in the secondaries of the two transformers measures pressure.

McLeod Gauge: Of the conventional pressure gauges, the McLeod enjoys the widest use, particularly in the laboratory. It is a liquid-level device and therefore has an inherent disadvantage—unless there is a freeze trap in the line connecting the gauge and the system contaminants are introduced from the liquids used to measure the level. And a measurable movement of liquid can only be obtained by compressing the vapor or gas. Thus the actual measurement is on the compressed gas and the true pressure is calculated by Boyle's Law.

Pirani Gauge: Another famous standby in high vacuum work is the Pirani gauge. It works on the principle that the higher the pressure in a system, the faster heat will be removed from a wire running through it. The Pirani gauge has been developed to utilize this phenomenon as a means of pressure determination. But care must be taken to insure accuracy.

Alphatron: The Alphatron is accurate at much higher pressures than any of the other vacuum gauges. It was developed to measure pressures between those where a bellows gauge can be employed (above 10 mm of mercury) and the other gauges in the sub-millimeter range. It employs the ionization principle. But instead of ionizing the gas with electrons emitted from a hot wire, as is done in earlier ionization gauges, it utilizes ions produced by bombardment of the low-pressure material with alpha particles from a small quantity of radium in the gauge. Measurement of the flow of current between two electrodes is an index of pressure.

MICROMANOMETER: With a diaphragm, greater accuracy.

Better Measurement: The new gauge promises to provide the ever-growing processing industry, which uses high vacuums, with a more accurate means of pressure measurement and easier process control.

Dirt Fall Collector

Today it is possible for a plant to determine whether it is wrongfully accused of polluting the surrounding air. This can be done with the new directional dirt fall collector, developed by Battelle Memorial Institute and marketed by Eberbach & Son Co.

The unit collects heavy dirt from the direction the wind is blowing. Thirty day collection periods are required to give complete information. And this information must be correlated with Weather Bureau data to determine the amounts of dirt coming in from any direction.

The instrument consists of a series of eight jars arranged in a circle. Metal funnels collect dirt not falling directly into the jar mouth from which it is brushed into the jar at the end of the collection period.

A canopy covers the nine jars. A center hole in the canopy is uncovered when the wind velocity is below

three miles per hour. Above this velocity the wind vane turns the canopy to uncover an outer hole so that dirt is collected in the jar corresponding to the wind direction. Direction cannot be determined at wind velocities below three miles per hour.

In a Tunnel

Latest attack on stream pollution with paper mill waste is the sulfite liquor burner now under test at Peshtigo, Wisconsin by Badger Paper Mills, Inc.

In operation sulfite waste will have its water content reduced from 90% to 40% in multi-effect evaporators. The concentrate is then burned—alone—in a burner under one of the four steam boilers at Badger's mill.

A tunnel type burner is being used, 8′ long and 40″ in diameter, and lined with refractory cement. Air is driven into the burner through tangential jets and combustion takes place when it meets a spray of concentrated sulfite liquor.

Hope: It is hoped that the concentrated liquor will raise enough steam to heat the multi-effect evaporators for liquor concentration. If this can be accomplished, a cheaper method will have been found for sulfite liquor disposal.

More Benzene

Recovery of benzene from coke oven gas will be increased from 3.6 million gallons per year to 3.9 million gallons by refrigerating the scrubbing oil at Donner-Hanna's plant at Buffalo, N. Y. Key: Benzene is more soluble in the oil at lower temperatures.

Cooling coke oven gas to increase the recovery of benzene is not new. All plants use water cooling. The amount of cooling (refrigeration) to be employed is a question of cost. And today's elevated benzene prices have also elevated the optimum recovery figures.

For $242,000, the value of Donner-Hanna's certificate of necessity, benzene production will be boosted by 300,000 gallons per year and according to Phillip S. Savage, Donner-Hanna's general manager, it will be ". . . cheaper than by synthesis from petroleum."

•

Vacuum Calculator: A slide rule vacuum calculator is now available from F. J. Stokes Machine Co. It will determine the pump capacity to evacuate a given volume in a given time. The vapor pressure of water at different temperatures and other data required for calculations on high-vacuum systems can also be measured by the new rule.

•

Non-Frosting Gage: Jerguson Gage & Valve Co. is producing a large chamber gage which is particularly adapted for reading liquid levels for liquids near their boiling point, such as those used in refrigeration systems. Frosting over of the gage is reduced by a patented frost-preventing unit.

•

Mechanical Seal: Teflon is now being used in the production of a new mechanical seal. Developed by Crane Packing Co., the flexible member, usually leather or synthetic rubber, is replaced by corrosion- and temperature (500 F)-resistant Teflon.

•

Vacuum Pump: Kinney Mfg. Co.'s new mechanical vacuum pump retains its volumetric efficiency well in the low-pressure regions. The oil-sealed system has a free air displacement of 2 cfm and can produce an absolute pressure reading as low as 0.1 micron on a McLeod gage.

•

Mercury Cleaner: A new oxifier, manufactured by the Bethlehem Apparatus Co. will clean 600 lbs. of mercury per day in 150 lb. batches. In operation the contaminated mercury is whipped into a spray by a series of paddles for several hours. During this time the air oxidizes the base metal content to a dry non-cohesive dust which is readily separated. The purified mercury can be used in the most precise scientific instruments.

•

Plug Valves: Homestead Valve Mfg. Co. has added a series of worm and gear operated plug valves to its line of lubricated plug valves. Cast in semi-steel and with a port area equivalent to 100% of the area of standard pipe, they are made of 8″, 10″ and 12″ sizes.

•

Gas Leak Locator: J. C. Zobrist & Co. has developed a liquid for the location of gas leaks. Operating in the same manner as a soap solution, the new liquid gives a single bubble with a tough film which lasts much longer than a soap bubble and stands out on the smooth surface.

•

Gauge Valve: A gauge valve with a male inlet is now being offered by Edward Valves, Inc. The new valve requires no nipples and is useful in making piping connections in cramped areas.

How can you use this unique Emery 955 Dimer Acid?

what is it?

Emery 955 Dimer Acid (di-linoleic acid) is a *liquid*, viscous dibasic acid with an apparent molecular weight of 600. It has excellent heat stability and low volatility. It undergoes the carboxyl group reactions typical of a monomeric acid. But, more than that, its polyfunctional nature allows polymerization, resinification, or similar type reactions with polyalcohols, polyamines, poiyvalent metals, etc.

what can it do?

The applications of this Dimer Acid are as varied as they are interesting. It forms sodium and potassium soaps very easily . . . and, though you might not expect it, they are *more* water soluble than sodium oleate. It also forms water-insoluble soaps with the common divalent metals.

The long chain polyesters of this acid possess rubber-like characteristics. In addition, Emery 955 Dimer forms low melting point, water-resistant polyamide resins. Acts also as a bodying agent in surface coatings and is a superior, partial replacement for hard-to-get drying oils.

Tested for 2 Years

Because the utility of Dimer Acid (formerly designated Emery M-461-R) has been firmly established in many diversified fields during the past two years, and commercial production standardized, it has now been transferred to the Chemical Sales Division as a standard product with the new designation, Emery 955 Dimer Acid. The success of its many unique properties has been proven in many commercial products and may give you competitive advantages you have never thought possible.

Typical Characteristics

Iodine Value	80-95
Acid Value	180-192
Neutralization Equivalent	290-310
Color, Gardner	12 max.
Unsaponifiable	2.0% max.
Viscosity, Gardner	Z4

Get the complete, detailed story of this remarkable Emery Dimer Acid. Mail the coupon now . . . for Emery's new, informative Dimer Acid booklet.

Emery Fatty Acids

EMERY INDUSTRIES, INC.

Carew Tower, Cincinnati 2, Ohio

Emery Industries, Inc., Chemical Sales Division
Dept. I • Carew Tower, Cincinnati 2, Ohio

Your 955 Dimer Acid sounds very interesting. Please rush my copy of your new Dimer Acid booklet.

Name.....

Title.....

Company.....

Address.....

City.....*Zone*.....*State*.....

Export Dept.: 5035 R. C. A. Bldg., New York 20, N. Y. • Branch Offices: 3002 Woolworth Bldg., New York 7, N. Y. • 221 N. La Salle St., Chicago 1, Ill. 187 Perry St., Lowell, Mass. • 401 N. Broad St., Philadelphia 8, Pa. • 420 Market St., San Francisco 11, Calif. • Whse. stocks also in St. Louis, Buffalo, Baltimore

SUN BATHERS: Chemical umbrellas do the tanning.

Sunshine and Sales

Manufacturers are readying shipments of sunburn preventives—generally based on organic chemical sun screens—as the heavy selling season approaches.

Bottles and tubes will still be the most widely used containers, but aerosol packages are edging into the picture.

Acquiring a suntan—and the feeling and appearance of good health it imparts is one summer aim of a large share of the populace. Preparations to make this operation a painless one contribute substantially each year to the profits of large cosmetic houses and more modest enterprises. This year the sun-worshipping segment of a well-heeled public should spend not less than several million dollars for countless brands of suntan lotions and creams.

Formulations that in father's day consisted of mixtures of vegetable fats and essential oils, have now largely given way to products containing synthetic organic chemicals that screen out the rays of the sun responsible for sunburn. Other combinations depend upon opaque ingredients such as titanium dioxide or zinc oxide, but these generally require relatively thick applications, and such products win little favor with would-be beach beauties. The active principles are not used alone but are incorporated into suitable oil or aqueous bases to produce oils, creams and ointments. The amount of screening agent used varies with its efficiency, the concentration usually not exceeding 15%.

Closed Door Policy: The lobster-red appearance sun bathers sport following exposure is a painful manifestation of the damage the sun's rays have done to their skin. Injured cells release substances that dilate the blood vessels, causing this erythema. At the same time, melanin, the natural pigment of the skin, moves from the inner layer of the skin to the outer, affording the protection of tanning. The latter action is secondary, so initial exposure should be limited to keep the skin from becoming severely burned and blistered before some protective layer is formed.

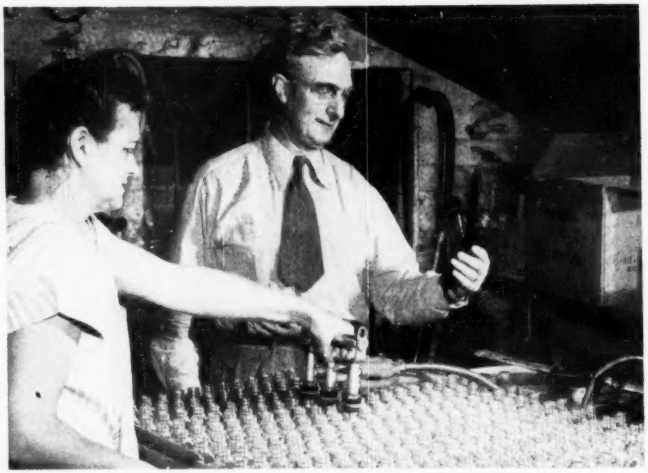
Radiant energy responsible for sunburn is predominantly that with wavelengths in the 2900-3200 range (angstrom units). Hence, to allow tanning without much erythema, it is necessary to screen off these wavelengths of the solar spectrum. Chemical "sun screens" in use possess high absorptive capacity for ultraviolet light in this range, protecting the skin from most of these rays while permitting the tanning process to proceed slowly.

Various aromatic compounds exhibit this property, some of the better-known including the following and/or their derivatives: aesculin, esculetin, *p*-amino benzoic acid, salicylic acid, anthranilic acid, β-methyl umbelliferone, *p*-hydroxynaphthoic acid, cinnamic acid, hydroquinone, quinine salts, coumarin, dibenzalacetone. Typical examples of suntan products on the market employing such materials are J. B. Williams' Skolex (propylene glycol *p*-amino benzoate); Artra Cosmetics' Sutra (hydroquinone); and Helena Rubinstein's "sun and windproof cream" (glyceryl salicyate).

Experiments carried out for the Army Air Forces when it was seeking a material to protect personnel downed in the ocean or desert from the sun (*J. Amer. Med. Assn., Jan. 5, 1946, 130, 1-6*) revealed that dark red veterinary petrolatum (Standard Oil Co. of N.J.) was opaque to erythemal energy, and resulted in its recommendation for this purpose. The military requirements for such a product were quite stringent—it had to be stable to heat and cold, non-toxic, lend itself to simple packing, not wash off—and eliminated many commercially acceptable formulations. Moreover, aesthetic considerations probably limit wide utility of sun protective ointments based on these findings. The study, however, did show that phenyl salicylate (salol) in a 10% cream was an excellent screen for ultraviolet radiation, was non-toxic, and suitable for incorporation in the opaque petrolatum, and presumably, other bases.

Bombs again: The majority of products now being shipped for the coming heavy selling season are packaged in bottles, tubes and jars. But the ever-spreading aerosol container with its push-button convenience is making headway here too.

Douglas Laboratories, Miami, was one of the first to bring out such a product, its Coppertone Sun Tan Oil being packaged in the 4-oz aluminum container of Sun Tube Corp., Hillside, N.J. (*CI, Sept., 1950, p. 379.*) Distribution has been expanded this year, but lack of aluminum will limit the number available this season. A 6-oz Crown can, made of black plate steel, is readily available, and Douglas, as well as other manufacturers interested in pressurizing their suntan lotions, may swing to that.



H. J. ATKINSON: Hay field into tank farm.

Specialties Farm

Sudbury Labs has parlayed $50 into a $50,000 annual net. Starting with soil-testing kits, this small specialties outfit expanded by adding new products its established outlets could handle and steering old products into new lines. Its roster now includes animal repellents, marine specialties, mildewproofer, rust preventive, wetting agent.

With spring just arrived, most people can summon up a smile at the prospect of green trees and warm days. H. J. Atkinson, owner of Sudbury Laboratories, small but versatile South Sudbury, Mass., specialties company, can do even better than that. He can break into a grin.

For with gardeners and boating enthusiasts feeling the urge to get going on their respective avocations, it will be the start of the heavy season for two of his lines—soil-testing kits and marine specialties. This year Atkinson will be anxiously checking the sales of the crystal rust preventive for marine engine cooling systems he introduced last spring. If it follows the course of other Sudbury products, he'll be busy shucking orders out of the daily mail in the next few weeks and the grin will broaden.

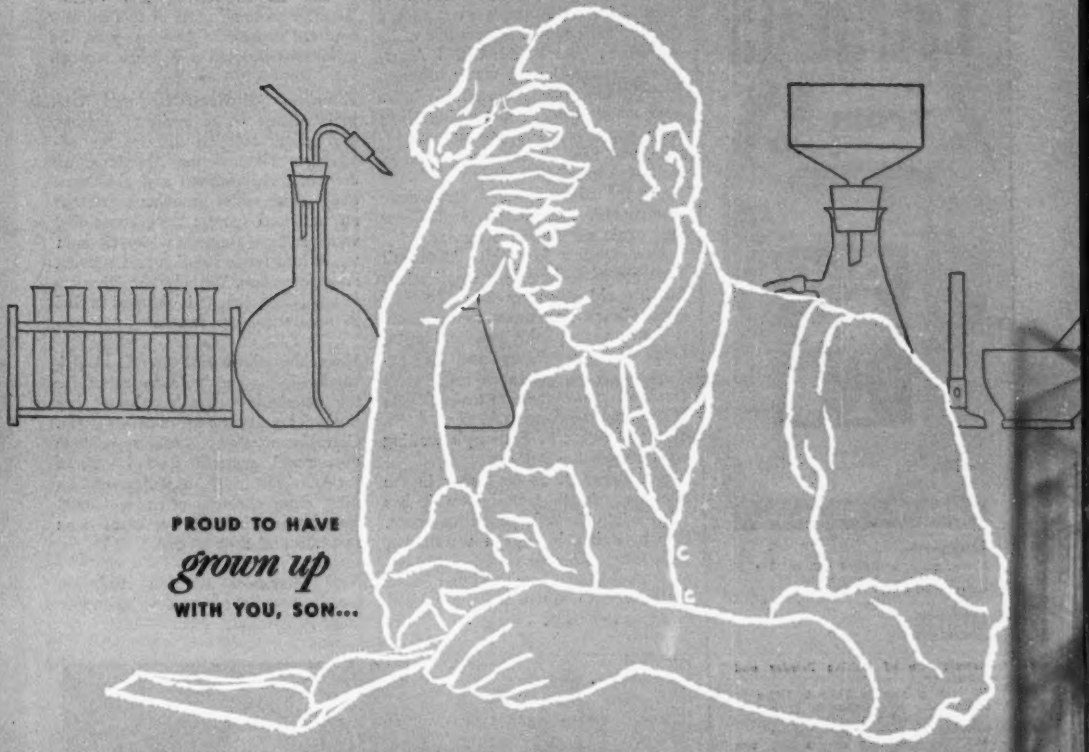
Business Query: This New England enterprise began back in 1932 when the then-Farmer Atkinson's crops were so good that his neighbors wanted to know why. The answer—he had been testing his soil; hence knew what fertilizers to add, what crops to plant—not only satisfied their curiosity, but put Atkinson in a new business.

He and his wife decided that every farmer should test his soil regularly. With $50, they set up a shop in a room in their farmhouse, began turning out soil-testing kits. Soon seed houses over the nation became interested, and Sudbury Labs was in the big time.

Cagey Jumper: With the business launched, Atkinson revealed himself as an idea man with a knack of knowing when to jump into something new. Seed houses after the season carried a line of pet supplies, so Sudbury, already supplying them with soil-testing kits, also began to turn out cleaning and flea powders and insect killers for them.

Then a Boston vet came up with a plant extract that had an odor offensive to animals but barely perceptible to humans. Sudbury snapped it up, began marketing Chaperone, a line of liquid repellents for dogs, cats and rabbits. It's now the largest seller on the market.

Atkinson's own interest in boats landed him in the marine specialties field. Items have been added over the years, and Sudbury now markets an automatic bilge cleaner; two marine water jacket cleaners; Dee-Solv, a cleaner for outboard motors; and a mildewproofer called Mildew Stop. The latter, while it has wide utility in preventing mildew of rope, sails, cushions, etc., is not confined to the marine field; it's being sold in some housewares stores, and is being used



PROUD TO HAVE
grown up
WITH YOU, SON...

If you're like many others in industry, you became accustomed to using Mallinckrodt chemicals in the chemistry class back in your student days. And many of you still specify Mallinckrodt chemicals whether you have since become a purchasing agent, research director, production manager, or top administrative executive.

Such loyalty is no accident. In 1919—about half a century after the founding of this business—Edward Mallinckrodt, Sr. expressed its continuing policy:

"We realized from the start that business depends on reciprocal relations and confidence; that we would have to establish a reputation for fair, honorable, liberal dealings and to make it to the interest of the buyer to place his orders with us, by supplying goods of the highest quality at competitive prices, giving prompt service and endeavoring to satisfy our customers as far as possible in every respect."

MALLINCKRODT CHEMICAL WORKS • St. Louis • New York • Montreal

Mallinckrodt®

ORGANIC INTERMEDIATES • INORGANIC CHEMICALS • CHEMICALS FOR ELECTRONIC USES • METALLIC SOAPS • ANALYTICAL REAGENTS • PHOTOGRAPHIC CHEMICALS

• MANUFACTURERS OF FINE CHEMICALS FOR INDUSTRY • SINCE 1867 •

by some dry cleaners in the South.

In 1940, Sudbury came out with a rust inhibitor which is now one of its big items. The liquid, called Aqua-Clear, is essentially a water softener. It deposits a thin "porcelain-like" film over metal surfaces, protecting them from corrosion. The product is potable, was used during the war in all canned water aboard life rafts. If plans for canned water for atomic emergencies materialize, Aqua-Clear may again see extensive service.

New Outlets for Old: Atkinson's alertness in finding new applications for his old products is evident in Aqua-Clear's companion items: Line-A-Tank, a rust inhibitor for booster tanks for fire engines, and Save-A-Tank, said to neutralize mild acids condensing in petroleum tanks. When he gets in a field, he looks around too. Witness Dowse-it, Sudbury's wetting agent to aid fire fighting.

Sudbury Labs is no longer in the one room in the farmhouse; it has moved into the enlargened henhouse. The barn has become a warehouse, with the hayloft an office. From the main road it looks like any other South Sudbury farm except for the alcohol tanks in the fields.

But its soil-testing kits ($1.00-$24.95) go to all parts of this country and are exported. And last year, the Atkinsons boasted a $50,000 income.

•

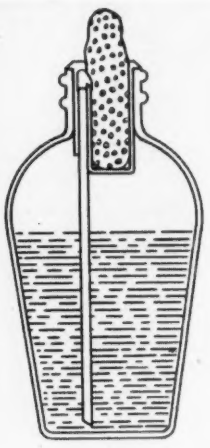
Aluminum Etchant: Reduced tank maintenance costs, superior etching, and longer solution life are the advantages claimed for Aluminux, an etchant for aluminum and aluminum alloys. The white granular powder is an inhibited caustic base containing water softening agents which tie hard water ions up in solution and prevent scale formation. Made by the Diversey Corp. (Chicago), it is shipped in 325 lb non-returnable drums.

•

Hexachlorophene Cologne: G-11 (Givaudan-Delawanna's trade name for the germicide hexachlorophene) has popped up in another place—cologne. Carnation-scented "48-hour cologne deodorant", manufactured by Proof Products (Detroit), has appeared on drug store shelves in an embossed glass bottle. There are two sizes—4 oz at $1.50 and 2 oz at 89¢.

•

New Shampoo: Cynthia Andrews, Inc. is introducing its new shampoo, Sing, in Syracuse, N.Y.



Bottle With a Built-In Jigger

Manufacturers of drugs, cosmetics, liquid detergents and other packaged liquids are eyeing a new type dispenser which permits the user to draw controlled amounts of liquid into a well at the top of a polyethylene bottle.

The well is force-fitted into the neck of the bottle, and, in effect, becomes a bottle within a bottle. Fingertip pressure on the walls of the bottle forces the liquid up the tube into the well, makes it accessible for direct application, topical application with swab or pad (see cut above) or for mixing with other ingredients. For exact measurements, the unit —called the Checkwell—can be graduated.

Only 4- and 8-oz samples are available, but other sizes can be made. Source: Plax Corp., Hartford, Conn.

Government Bleach: A $3 million plant to produce a bleach used by the Army Chemical Corps in decontamination work will be built near the government-owned Marshall Plant at Natrium, W. Va. Contract for design and construction of the building has not been let yet.

•

S & D Construction: First new building to go into production at Sharp & Dohme's West Point, Pa., site, is its new $1.5 million synthetic chemical plant. Output will be basic ingredients for the company's pharmaceuticals.

Meanwhile construction has just begun on a $175,000 branch warehouse in Kansas City, Mo. It will be ready by October, will double present floor area of that branch serving Western Missouri, Kansas, most of Nebraska and Oklahoma and parts of Arkansas and Iowa.

•

3-M Fire: A warehouse completed last fall at Minnesota Mining & Manufacturing Co.'s Hutchinson, Minn. plant, has just been destroyed by fire. Loss was estimated at $1 million—$450,000 for the building and fixtures, and the remainder for stocks of Scotch cellophane and other tapes.

•

Methoxychlor Data: Du Pont (Grasselli Chemicals Dept.) will send interested parties a new bulletin on analytical procedures for the insecticide, methoxychlor, as well as a report on three-year residue studies relating to it.

•

Wool Processing Aid: A new textile specialty, Maxitol No. 10, has been developed by Dexter Chemical Corp. (New York) to protect wool and promote even dyeing during chromate dyeing operations. It is said to become a part of the wool fibre, and in addition to buffering the action of chrome, to prevent harshness and loss of tensile strength in wool during subsequent processing.

•

Paper Mill Defoamer: A new liquid defoamer for the paper industry, trade named De-airex 506, has been developed by E. F. Houghton (Philadelphia). It's a clear amber oil that is soluble in hot or cold water.

PICTURES IN THIS ISSUE:

Cover (top)—Lynn Crawford; Cover (bottom)—Rohm & Haas; p. 13—Wide World; p. 15—Westinghouse Photo.

Briefs

From recent literature

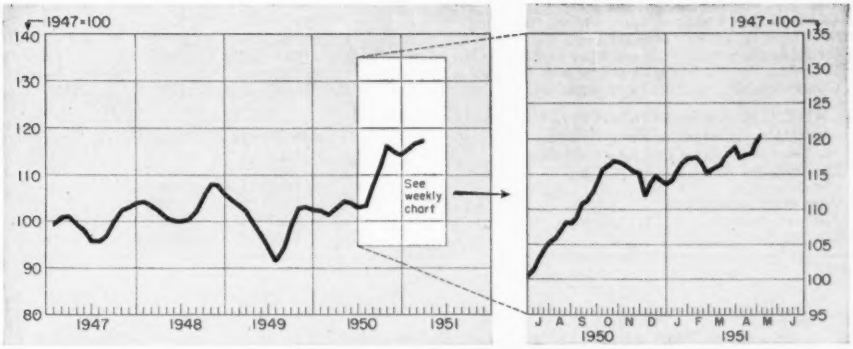
Paint remover compositions consisting essentially of a chlorinated solvent, such as ethylene dichloride, 0.1-50% by weight of a mixture of approximately equal parts of 90% concentration formic acid and 100% concentration acetic acid, and 0.01-6% by weight of water have been found to have very high stripping power.

Rubberlike materials having many of the properties of natural rubber are reported from the reaction of ethylene dichloride with a solution or dispersion of sulfur in an alkali metal monosulfide solution. This reaction must take place in a closed reaction vessel and the time and temperature kept as low as possible to produce a satisfactory product.

Alkaloidals can be extracted from plant material by use of concentrated aqueous ammonia and ethylene dichloride. For each kilogram of ground plant material, 400 ml. of 30% aqueous ammonia and 4,000 ml. of ethylene dichloride is preferred. It is convenient to operate between room temperature and the boiling point of ethylene dichloride and the extraction time must be determined experimentally for each plant material.

These developments are abstracted from recent publications or U. S. patents. The uses may suggest other applications of Jefferson Ethylene Dichloride in your products or processes.

CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX — Basis: Total Man-Hours Worked in Selected Chemical Industries

Long-awaited action on chemical import prices materialized this week. Ceiling Price Regulation 31 sets up these limits: No importer may take a bigger dollars-and-cents mark-up than he did during the July 1, 1949-June 30, 1950 period. Iodine, graphite, copper and zinc are exempt.

A number of anthraquinone dyes are now on allocation in the wake of heavier requirements by the military. Defense orders can take a maximum of 30% of any month's production. Revision of the earlier NPA order M-32 have eased demands for DDT, a boost to the civilian and agricultural users. Allocations have been reduced to 20%, and producers now get a 15 day lead time for meeting these priority demands.

Numerous changes have been noted in the chemical market because of seasonal peak consumption. Copper sulfate supplies declined as needs for fungicides increased; producers inventories are down to less than two weeks' output.

Supplies of potash are relatively plentiful, and considerably ahead of last year's strike-curbed production. Nitrates should remain fairly abundant, with record domestic production and prospects of larger supplies of the imported natural product.

The easing in alkalis is now well established. Liquid caustic soda is beginning to catch up with demand, and the improvement in soda ash is not just a passing incident. Shortage in solid caustic soda is due in large measure to export activity for South American markets.

Ice-cream makers' demand for carboxymethyl cellulose is usually expected by producers at this time of the year, but current reports indicate over-size inventories for these consumers. But this situation won't bother producers to any extent. Demand for synthetic detergents and wider usage in well drilling muds will keep output at capacity.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	120.0	120.7	103.9
Bituminous Coal Production (Daily Average, 1000 Tons)	1,737.0	1,772.0	1,888.0
Steel Ingot Production (Thousand Tons)	2,073.0	2,079.0	1,908.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	143.9	144.0	116.7
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	238.5	233.3	184.3
Chemical Process Industries Construction Awards (Eng. News-Record)	$22,934,000	$21,790,000	$6,031,000

MONTHLY BUSINESS INDICATORS—WHOLESALE PRICES (Index 1926=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	172.4	171.8	146.1
Chemicals and Allied Products	146.4	147.3	116.3
Chemicals	138.2	139.0	115.4
Drugs and Pharmaceuticals	185.1	185.2	121.9
Fertilizer Materials	118.1	118.1	117.3
Oils and Fats	214.6	217.3	125.6

More nitrocellulose is available today than at any time during the last few months. Reason: shortage of solvents and plasticizers, especially castor oil, for processing.

Ethyl cellulose, as far as non-defense uses are concerned, is still no easier to come by than the day it was first allocated. A new DO rates no better than September delivery because of other priority demands of longer standing.

In this topsy-turvy market, prices of scarce chemicals in carloads are often higher than in small lots. Supply-pinched jobbers force prices up in trying to fill the order, then must pass along the higher price to their customers.

Spot resale quotations on three such items this week: phenol 60-65¢; sodium bichromate 27-28¢; and ethanolamine 55¢ a pound in less carlots.

CIW estimates a fractional decline in chemical output for the coming week to 120.0, down 0.7 from the week before. Wholesale chemical prices displayed a slight downward trend, marked by a flurry of competition in essential oils that brought selling prices in some cases below current replacement costs. Trading remains comparatively quiet until effects of the latest OPS domestic ceilings can be gauged.

Two notable price declines of the past week: supply improvement of tung oil shaded prices to 40½¢ a pound; p-amino salicylic acid (PAS) dropped 50¢ a pound to $5.50, following the familiar pattern for many pharmaceutical products.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending May 7, 1951

	Change	New Price		Change	New Price
UP					
Carnauba Wax, No. 1 Yellow	$ .02	$ 1.29	Menthol, nat. USP	$ .25	$ 11.25
Casein, imp. acid-ppt.	.005	.40	Orange Oil, Florida	.35	2.00
Cocoa Butter	.02	.74			
DOWN					
Coconut Oil, crude, tanks, Pac. ports	.005	.175	Sandalwood Oil	.75	13.00
Copra, ton, cif., Pacific ports	2.50	227.50	Soybean Oil, crude, tanks	.0025	.2025
Eucalyptus Oil, 80-85%	.05	1.45	Spruce Oil	.05	2.55
Molasses, blackstrap, New Orleans	.005	.335	Tin Oxide	.04	1.42
Ouricury Wax, ref.	.02	.93	Tung Oil, tanks	.005	.405
p-amino salicylic acid (over 1000 lb.)	.50	5.50			

All prices per lb. unless quantity is stated

U. S. CAPACITY FOR HYDROGEN CYANIDE AND SODIUM CYANIDE
(expressed as millions of pounds of hydrogen cyanide)

PRODUCER	LOCATION	PROCESS	1948	1950	1951	1952	MAJOR USES
American Cyanamid Co.	Warners, N. J.	Sodium cyanide	13	23	23	23	Acrylonitrile and metal cyanides
Carbide & Carbon	Institute, W.Va.	Methane and ammonia	--	--	13	13	Acrylonitrile
E. I. du Pont de Nemours & Co.	Belle, W. Va.	Formamide	6	6	6	6	Methacrylate esters
E. I. du Pont de Nemours & Co.	Niagara Falls, N. Y.	Sodamide and carbon	20	20	20	20	Adiponitrile and sodium cyanide
E. I. du Pont de Nemours & Co.	Memphis, Tenn.	Methane and ammonia	--	--	--	60	Adiponitrile and sodium cyanide
E. I. du Pont de Nemours & Co.	Victoria, Texas	Methane and ammonia	--	--	15	15	Adiponitrile
Koppers Co.	Kearney, N. J.	Recovery from coke oven gas	--	--	1.5	1.5	Liquid hydrogen cyanide
Monsanto Chemical Co.	Texas City, Texas	Methane and ammonia	--	--	--	35	Acrylonitrile
Rohm & Haas Co.	Houston, Tex.	Methane and ammonia	--	7	15	18	Acrylate esters
Total			39	56	93.5	191.5	

Fibers Spur Cyanide Boom

Cyanide production will double this year, redouble in 1952, as large demands for production of nylon and acrylonitrile polymers boost requirements.

Present boom is abetted by a new process for production of hydrogen cyanide from natural gas and ammonia.

Long dormant, the cyanide* industry is entering a new expansion era. Reason: injection of a goodly shot of "growth factor" in the form of several new synthetic fibers based on acrylonitrile polymers and use of cyanides for the formation of nylon (CIW, p. 18, April 21, 1951).

Until 1950 the cyanide content of imported calcium cyanide (the black cyanide of commerce) had always equalled or exceeded domestic production. But this situation no longer exists. This year will see output of domestic cyanide doubled and the 1951 figure will be redoubled in 1952. By the end of 1952 cyanide, expressed as hydrogen cyanide, should hit a 190 million pounds per year rate.

As yet there has been no decline in imports—nor is one expected for some time to come. The increase in output will be wholly gobbled up in the production of new materials—not used for replacement of now-imported material.

Growth Factor: Although Rohm & Haas is carrying out a sizable increase in facilities for acrylate production, the major ingredients in the burgeoning of the cyanide industry are (1) use of sodium cyanide or hydrogen cyanide for the synthesis of adiponitrile for nylon at three plants and (2) development of polyacrylonitrile fibers by Du Pont, Carbide & Carbon, and Chemstrand (Monsanto and American Viscose). American Cyanamid is also expected to join the latter group in the near future.

Not Yet But Soon: The future of the cyanide industry is tied to the future of synthetic fibers even though this pattern does not appear too clearly in the 1950 end use pattern. Plastics and elastomers comprised the largest use for cyanides for that year. Nearly half of the total cyanide output was consumed in the manufacture of GR-N and acrylate polymers. But demands for synthetic fibers will take over the No. 1 spot in 1951.

Cyanide End Use Pattern for 1950
(expressed as millions of pounds of hydrogen cyanide)

Product	Quantity
Acrylonitrile	14
Acrylates	13
Metal Salts[1]	22
Dyes	1
Export	1
Fumigation	2
Miscellaneous	3
Total	56

Cyanide to fill these demands was provided principally by imported calcium cyanamid with smaller quantities being provided from formamide, natural gas, and sodium cyanide. However, natural gas will be the major source in 1951.

Sources of Cyanide in 1950
(expressed as millions of pounds of hydrogen cyanide)

Source	Quantity
Black cyanide	23
Formamide	6
Natural gas	7
Sodium cyanide	20
Total	56

Completed Cycle: The lusty demand for cyanide for conversion to

* Cyanide, as used here, includes hydrogen cyanide, sodium cyanide and calcium cyanide.

1. Includes cyanide used in adiponitrile production.

fiber polymers has been helped by the discovery of the necessary know-how for production of low-cost hydrogen cyanide from natural gas and ammonia. And with this development the cycle is now complete. Until recently nearly all hydrogen cyanide was made from sodium or calcium cyanide and sulfuric acid. However, in Du Pont's latest plant at Memphis, Tenn., hydrogen cyanide will be made from natural gas and ammonia for subsequent conversion to sodium cyanide by reaction with caustic soda. A sizable portion of this output is believed to be headed to adiponitrile from furfural for nylon.

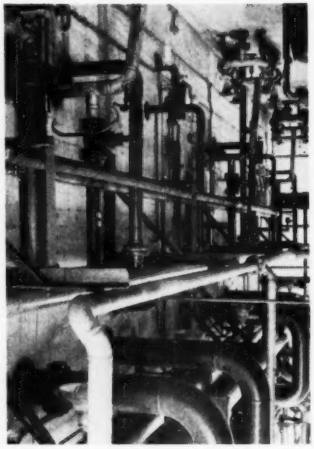
Originally the non-adiponitrile output from this cyanide plant was scheduled to replace sodium-derived material from Niagara Falls, N. Y. Now it is planned to keep both units in operation.

Processes: The first commercial plant to make hydrogen cyanide from methane and ammonia was that of Rohm & Haas at Houston. Here the cyanide is converted into various acrylate and methacrylate esters. With capacity doubled in 1951, it represents the only sizable non-fiber expansion with the exception of a portion of the output of Du Pont's huge new plant at Memphis.

The processes employed by each producer differ in details. But they are all variants on the basic process originally developed by Andrussow. In this method hydrocarbon (usually methane) and ammonia are heated to somewhat over 1000 C for a non-catalytic conversion to hydrogen cyanide and hydrogen. Oxygen or air can be added to provide the required heat for this highly endothermic reaction by burning a portion of the hydrocarbon. However, the non-oxidative process is preferred. With a short time of contact yields on an ammonia basis are of the order of about 60%-70%.

Black Cyanide: Prior to the development of cyanide from natural gas most cyanide used in the United States was made from the so-called black cyanide (45% calcium cyanide). This material, imported from Canada by American Cyanamid, is formed from calcium cyanamid by heating with sodium chloride and carbon.

Castner: The only domestic sodium cyanide is manufactured by the Electrochemicals Department of Du Pont at Niagara Falls. In the Castner process, used there, metallic sodium is heated with ammonia to produce sodamide. This is converted to high-analysis sodium cyanide by reaction with carbon. The hydrogen liberated from the sodamide is recycled by returning it to a unit for conversion to ammonia.



HYDROGEN CYANIDE: Now from natural gas and ammonia.

Formamide: The only other cyanide synthesis to achieve commercial stature is dehydration of formamide. This is carried out by the Polychemicals Department of Du Pont at Belle, W. Va. IB cyanide is converted to polymethyl methacrylate. Although the original plant is still in operation, Du Pont has seen fit to expand via the Andrussow route. Thus it would seem that the formamide process is now uneconomic.

The only other domestic source of hydrogen cyanide is the small amount recovered from coke oven gas by Koppers. The gas is first washed with a solution of sodium carbonate to remove both hydrogen cyanide and sulfide. After desorption, the sulfide and cyanide are separated by a second wash and the cyanide liquefied for sale in cylinders.

More to Come: Despite the huge expansion that has taken place in cyanide production, there is still more to come. Chemstrand's new nylon facility will probably be based on cyanide too. American Cyanamid has developed a new polyacrylonitrile fiber, requiring still more cyanide. Despite these huge new needs there will be very few shortages; most of the new demands are for such large volumes that the cyanide unit will be an integral part of the plant design.

GOVERNMENT AWARDS*

Item	Supplier	Location
Dallas Chemical Procurement District, Dallas 2, Tex.:		
titanium (powdered)	Metal Hydrides, Inc.	Beverly, Mass.
Armed Services Medical Procurement Agency, Brooklyn 1, N.Y.:		
typhus vaccine	Pitman-Moore Co.	Indianapolis, Ind.
typhus vaccine	Lederle Laboratories	New York, N.Y.
penicillin (crystalline)	C.S.C. Pharmaceuticals (Div. of Commercial Solvents Corp.)	New York, N.Y.
Head Quartermaster, U.S. Marine Corps., Washington 25, D.C.:		
soap	Baltimore Chemical Corp.	Baltimore, Md.
soap	Newell Gutradt Co.	San Francisco, Cal.
soap	Pioneer Soap Co., Inc.	San Francisco, Cal.
Headquarters, Air Materiel Command, Dayton, Ohio:		
lubricating oil	Rohm & Haas Co.	Philadelphia, Pa.
photographic film	The Haliod Co.	Rochester, N.Y.
Navy Purchasing Office, New York:		
trichloroethylene (vapor, degreasing)	Niagara Alkali Co.	New York, N.Y.
New York Chemical Procurement District, N.Y.:		
zinc oxide (grade I, class A)	The New Jersey Zinc Sales Co.	New York, N.Y.
zinc oxide (grade I, class A)	St. Joseph Lead Co.	New York, N.Y.
Raritan Arsenal, Metuchen, N.J.:		
phosphoric acid (metal conditioner, concentrated wash-off type I)	Axton-Cross Co.	Shelton, Conn.
N.Y. Quartermaster Procurement Agency, 111 E. 16th St., New York:		
duplicating machine ink	Howard Flint Ink Co.	Detroit, Mich.
trisodium phosphate (technical)	Blockson Chemical Co.	Joliet, Ill.
neatsfoot oil	The Neatsfoot Oil Refineries Corp.	Philadelphia, Pa.
neatsfoot oil	The Jones-Hamilton Co.	Oakland, Cal.
Aviation Supply Office, Philadelphia 11, Pa.:		
interior oil paint	Seidlitz Paint & Varnish Co.	Kansas City, Mo.
zinc chromate primer	W. P. Fuller	Los Angeles, Cal.
pigment (dry, medium, chrome yellow)	E. I. du Pont	Wilmington, Del.
zinc chromate primer	Pittsburgh Plate Glass Co.	Newark, N.J.
glass fibers (superfine silicon-coated)	Libbey-Owens-Ford Glass Co.	Toledo, Ohio
exterior oil paint	Bradley Paint Co.	Los Angeles, Cal.
abrasive paper (silicon-carbide)	The Carborundum Co.	Niagara Falls, N.Y.

* Security regulations prevent disclosure of quantity and dollar volume.

MEETINGS .....

Flavoring Extract Mfrs. Assn., annual meeting, Statler Hotel, New York, N.Y., May 20-23.

Amer. Zinc Inst., annual meeting, Statler Hotel, St. Louis, Mo., May 21-22.

Amer. Assn. of Cereal Chemists, annual meetings, Nicollet Hotel, Minneapolis, Minn., May 21-25.

Natl. Assn. of Margarine Mfrs., annual meeting, The Homestead, Hot Springs, Va., May 24-25.

Soc. of the Plastics Industry, Greenbrier Hotel, White Sulphur Springs, W. Va., May 24-25.

Assn. of Consulting Chemists and Chemical Engineers, outing, Westchester Country Club, Rye, N.Y., May 25.

Federation of Paint & Varnish Production Clubs, council meeting, Book Cadillac Hotel, Detroit, Mich., May 25-26.

Soc. for Applied Spectroscopy, annual meeting, Socony-Vacuum Training Center, New York, N.Y., May 25-26.

Natl. Sales Executives, annual meeting, Waldorf-Astoria Hotel, New York, N.Y., May 31-June 1.

Natl. Assn. of Purchasing Agents, annual meeting, Waldorf-Astoria Hotel, New York, N.Y., June 3-6.

Natl. Fertilizer Assn., annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., June 11-13.

Natl. Organic Chemistry Symposium, Shirley-Savoy Hotel, Denver, Colo., June 12-15.

Amer. Council of Comml. Laboratories, Ambassador Hotel, Los Angeles, Calif., June 14-15.

Mfg. Chemists Assn., annual meeting, joint outing with SOCMA, Greenbrier Hotel, White Sulphur Springs, W. Va., June 14-16.

Synth. Org. Chem. Mfrs. Assn., joint outing with MCA, Greenbrier Hotel, White Sulphur Springs, W. Va., June 14-16.

Amer. Plant Food Council, annual meeting, The Homestead, Hot Springs, Va., June 14-17.

Chem. Inst. of Canada, annual conf., Winnipeg, June 18-20.

Amer. Soc. for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, June 18-22.

BOOKS .....

Plant Layout: Planning and Practice, by Randolph W. Mallick and Armand T. Gaudreau. John Wiley & Sons, Inc., New York, N.Y; 391 pp., $7.50.

By applying a scientific approach to the problems of receiving, storing, transporting, inspecting, shipping, repairing and office work, the authors have organized plant planning and layout information into an engineering science. Here are complete engineering techniques for determining plant capacities, balancing machine operations, designing production lines and analyzing material-handling systems.

Quantitative Analysis, Third Edition, by William Rieman, III, Jacob D. Neuss, and Barnet Naiman. McGraw-Hill Book Co., New York, N.Y.; x+523 pp., $5.

Like its predecessors, this third edition stresses the theoretical approach to quantitative analysis, explains analytical procedures, accordingly, in the light of physical chemistry and treats the application of the modern theory of electrolytic solutions to quantitative analysis. In this edition, however, there is a more detailed discussion of fundamental laboratory techniques and a new chapter on the theory and use of ion exchange in analytical chemistry.

Briefly Listed

EVALUATION OF EXPERIMENTAL POLYMERS PRODUCED BY THE OFFICE OF RUBBER RESERVE, 17-p., 1949 report recently declassified by U. S. Air Force's Air Materiel Command. Describes test procedures and the effect of varying polymerization conditions on the properties of synthetic rubber polymers produced by the Office of Rubber Reserve. Available from Librarian of Congress, Washington 25, D.C., for $2 in microfilm, and $3.75 in photostat form.

BIBLIOGRAPHIC SURVEY OF CORROSION, 1946-1947, comprises over 3000 abstracts of corrosion literature published during 1946 and 1947; included is an index designed to classify the material so that it might be of value along both theoretical and practical lines. Can be acquired from the National Association of Corrosion Engineers, 919 Milam Bldg., Houston 2, Tex., at $9 per copy. ($7 per copy to members NACE.)

BRITISH CHEMICALS AND THEIR MANUFACTURERS, 1951, published by the Association of British Chemical Manufacturers, with a view to giving purchasers information on the products made by members of the Association; in addition to grouping chemical industries, volume includes classified list of British chemicals, proprietary and trade name list and trade mark index. Write to the ABCM, 166 Piccadilly, London W.1.

MARKET PLACE

LOCAL STOCKS • CHEMICALS • RAW MATERIALS • EQUIPMENT • SUPPLIES

Professional Services

A GUIDE TO CHEMICAL, CHEMICAL ENGINEERING, MARKETING, AND LABORATORY SERVICES

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

$1.20 a line, minimum 3 lines.
To figure advance payment count 5 average words as a line.

EMPLOYMENT WANTED and Individual Selling Opportunity undisplayed rate is one-half of above rate, payable in advance.

PROPOSALS, $1.20 a line an insertion.

INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:

The advertising rate is $8.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches —to a page C. I. W.

NEW ADVERTISEMENTS received by 10 A. M. May 9th at the New York Office, 330 W. 42nd St., New York 18, N. Y., will appear in the May 19th issue subject to limitations of space available

---

SELLING ? BUYING ?

Call
"CONSOLIDATED"
USED MACHINERY FOR THE
CHEMICAL & PROCESS INDUSTRIES
Including Paint, Food, Rubber, Plastics, Sugar, Drugs, Cosmetics and Allied fields. Single items to complete plants.
CASH FOR YOUR IDLE EQUIPMENT
CONSOLIDATED
PRODUCTS CO., INC.
14-18 Park Row, New York 38, N. Y.
BArclay 7-0600

LIQUIDATING EQUIPMENT
former ALCOHOL PLANT

Capacity 1200 W.G. of 190 proof alcohol per day.

DISTILLATION EQUIPMENT
COOKING EQUIPMENT
YEAST EQUIPMENT
TANKS, PUMPS, ETC.

Write for list.

PERRY EQUIPMENT CORP.
1521 W. Thompson St.
Phila. 21, Penna.

GEAR UP FOR BIGGER PRODUCTION WITHOUT DELAY

GOOD USED EQUIPMENT
Ready for Immediate Shipment

It's Impossible to List in this space the 5000 Machines available from your FIRST SOURCE

Send for our Latest List

FIRST MACHINERY CORP.
157 HUDSON ST.
WOrth 4-5900
NEW YORK 13, N.Y.

Jackson-Cross

OFFERS FOR SALE
AS
EXCLUSIVE AGENTS
THE
EASTON, PA. PLANT
OF THE
PENNA. SALT MFG. COMPANY

- Approx. 50,000 Sq. Ft.
- Over 95 Acres
- 21 Buildings
- Lehigh Valley R. R. Sidings
- Immediate Possession at a
- Very Favorable Price

Write, wire or phone LOcust 7-1505

Jackson-Cross Company
Lincoln-Liberty Bldg.
Phila. 7, Pa.

TECHNICAL EXECUTIVE

Chemical engineer, experienced in production, research consulting and personnel management. Desires managerial post in company training programs, supervisory or advisory capacity in production or development in a chemical industry. PW 9589 Chemical Industries Week, 330 W. 42nd St., New York 18, N. Y.

SELL TO, BUY FROM, EUROPE

Outstanding chemical executive leaving for Europe to organize top-notch distributing agency with specialized sales force desires contact with firms in related fields.

B09742 Chemical Industries Week
330 W. 42 St., New York 18, N.Y.

Don't forget the
Box Number

WHEN answering the classified advertisements in this magazine, don't forget to put the box number on your envelope. It's our only means of identifying the advertisement you are answering.

AT YOUR SERVICE

The recognized national medium for the disposal of used or surplus new equipment; for the advertising of positions wanted or vacant; of business opportunities, etc. are the

SEARCHLIGHT SECTIONS of

AMERICAN MACHINIST
AVIATION WEEK
BUS TRANSPORTATION
CHEMICAL ENGINEERING
CHEMICAL INDUSTRIES WEEK
COAL AGE
CONSTRUCTION METHODS & EQUIPMENT
ELECTRICAL CONSTRUCTION & MAINTENANCE
ELECTRICAL MERCHANDISING
ELECTRICAL WORLD
ELECTRONICS
ENGINEERING & MINING JOURNAL
ENGINEERING NEWS-RECORD
FACTORY MANAGEMENT & MAINTENANCE
FLEET OWNER
FOOD ENGINEERING
NUCLEONICS
POWER
PRODUCT ENGINEERING
TEXTILE WORLD
WELDING ENGINEER

for information on rates, etc., write *Classified Advertising Division*

McGRAW-HILL PUBLISHING CO., INC.
330 W. 42nd St., N. Y. 18, N. Y.

READER SERVICE . . . . .

HOW TO USE COUPON

For additional information on editorial items or products advertised, fill out coupon by circling number. Requests will be forwarded to the proper company; answers will be sent directly to the reader.

There is a page number on the coupon for each advertisement. Letters following the number locate the ad on the page (L-left, R-right, T-top, B-bottom). Small letters following the number indicate additional products in the ad.

For editorial items, the ABC's distinguish among several items on a page.

NEW PRODUCTS

Cyanuric Chloride 26A
Dichloroacetaldehyde 26B
Dilinoleic Acid 25B
Ethylene Chlorobromide 26B
Saponim 26C
Trichlorobenzene 25C
Trichlorobromide 26B
Xenon 25C

NEW EQUIPMENT

Gas Leak Locator 30I
Gauge Valve 30J
Mechanical Seal 30E
Mercury Cleaner 30G
Non-Frosting Gage 30D
Plug Valves 30H
Vacuum Calculator 30C
Vacuum Pump 30F

TECHNICAL LITERATURE

Chemicals

Insecticides 48B
Metal Cleaners 48D
Protovac Casein 48C
Research Chemicals 48E
Synthetic Detergent 48A

Equipment

Catalyst Level Measuring 48K
Electric Motor Drives 48G
Gas Cleaning 48M
Laboratory Equipment 48I
Safety Heads 48F
Speed Reducers 48H
Stainless Steel Tubing 48L
Stainless Steels 48J

General

Consultant Organization 48N

PRODUCTS ADVERTISED

For more data, circle number on coupon

Chemicals
- Acetic acid 27b
- Acetone 27c
- Adipyl dihydrazide . . . . . Ih
- Adipyl dihydrazide-formaldehyde polymer Ii
- Alkyl aryl sulphonates 43
- Ammonium bicarbonate 36
- Aroclors 10-11g
- Basic materials for chemical industry 50
- Boron trifluoride 49b
- Catalysts 9
- Caustic soda, three grades 5
- Coal tar 12
- Copper dihydrazine sulphate . . . . . Ig
- Detergent & wetting agent, santomerse No. 1 . . . . . 10-11d
- Dihydrazine oxalate . . . . . If
- Dihydrazine sulphate Ic
- Dimer acid, booklet 31
- 2,4 dinitrophenylhydrazine Il
- Distilled monoglycerides 20
- Di-tert-butyl-cresol, bulletin C-9-115 4
- Electronic tube 19
- Ethylene dichloride 38
- Ferrous ammonium sulfate 49c
- Formaldehyde 27a
- General line 35
- HB-40 . . . . . 10-11i
- Hydrazine anhydrous . . . . . Ia
- Hydrazine hydrate . . . . . Ib
- Hydrazine monohydrobromide . . . . . Id
- Hydrazine monohydrochloride . . . . . Ie
- Hydrazodicarbonamide . . . . . Ik
- 8 Hydroxy quinoline base B34a
- Isocyanates, bulletin P-125 . . . . . 10-11h
- Margaric acid 44a
- Methacrolein 44c
- Methanol 27d
- Methyl borate 44b
- Methylhydrazine 44d
- Olefins
  - Diisobutylene 6a
  - Nonenes 6c
  - Triisobutylene 6b
- Para amino benzoic acid B34b
- Peroxides, ketone T37
- Potassium acetate 49a
- Reagent acids 49d
- Resins
  - Acrypol 1d
  - Butacryl 1a
  - Dermine 1c
  - Polycryl 1b
  - "Vinsol," booklet 28
- Sebacic acid 30
- Sebacyl dihydrazide . . . . . Ij
- Sterox SE and SK, bulletin P-133 . . . . . 10-11e
- Sterox No. 5 & No. 6, bulletin No. P-136 . . . . . 10-11f
- Surface active agents
  - D-40 . . . . . 24b
  - For agricultural insecticides & herbicides 22a
  - For chemical processing 22b
  - For compound detergents 22c
  - For dairies 22d
  - For drugs & cosmetics 22e
  - For food 22f
  - For leather 22g
  - For lubrication 22h
  - For metal cleaning 22i
  - For metal working 22j
  - For paints, dyes & inks 22k
  - For paper 22l
  - For petroleum 22m
  - For plastics 22n
  - For polishes & waxes 22o
  - For rubber 22p
  - For textiles 22q
  - For water paints 22r
  - Sodium sulfonates 24c
  - Wetting agent "S" 24a
- Synthetic organic 2
- Tetracthylthiuram disulfide 10-11a
- Tetramethylthiuram disulfide 10-11b
- Tetramethylthiuram monosulfide 10-11c

Containers
- Cans, style "F" 32
- Shipping sacks, multi-wall paper 3

Mist eliminators BL37
Research on substitutes for shortages T34

SEARCHLIGHT SECTION

(Classified Advertising)

EQUIPMENT
(Used or Surplus New)
For Sale 46

WANTED
Equipment 46

ADVERTISERS INDEX

Consolidated Products Co., Inc. 46
First Machinery Corp 46
Jackson-Cross Co. 46
Perry Equipment Corp. 46

READER SERVICE COUPON

Mail to Chemical Industries Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

Editorial Items

25C	26A	26B	30D	30G	30J	48C	48F	48I	48L	
25C	26B	26C	30E	30H	48A	48D	48G	48J	48M	
25B	26B	30C	30F	30I	48B	48E	48H	48K	48N	

Ia	Ii	2	10-11a	10-11i	22e	22m	24b	30	36	44c
Ih	Ij	3	10-11b	12	22f	22n	24c	31	T37	44d
Ic	Ik	4	10-11c	19	22g	22o	27a	32	B37	49a
Id	Il	5	10-11d	20	22h	22p	27b	T34	38	49b
Ie	1a	6a	10-11e	22a	22i	22q	27c	B34a	43	49c
If	1b	6b	10-11f	22b	22j	22r	27d	B34b	44a	49d
Ig	1c	6c	10-11g	22c	22k	24a	28	35	44b	50
Ih	1d	9	10-11h	22d	22l					

Expires August 12, 1951

BOOKLETS . . . . . .

Chemicals

Synthetic Detergent

28-p. booklet discussing the textile applications of the synthetic detergent, "Nacconol NR" and pointing out new methods which can lead to increased production with economies in processing chemicals, fuel and water, all three of which are important in wet processing of textiles. All types of goods are covered including wool, other animal fibers, synthetic fabrics, cotton, silk and mixed goods. National Aniline Div., Allied Chemical & Dye Corp.

Insecticide

32-p. booklet entitled, "The Story of Lindane," stressing the importance and potentialities of this product as used in insecticide formulations in all fields of agriculture, in homes, livestock, etc.; background is given on the company behind the product, research information and technical data on its chemistry. California Spray-Chemical Corp.

Protovac Casein

Technical bulletin describing Protovac casein PV-7916, a potassium caseinate, especially designed for use in clarification of wines but also capable of effecting the removal of heavy metal ions, such as copper, iron and lead. The Borden Co.

Metal Cleaners

Booklet dealing with the firm's line of heavy-duty metal cleaners, pointing out the types of soil removed and the physical and chemical methods used in their removal; among those discussed are cleaners for removing buffing and drawing compounds, for emulsifying oils, fats and greases and for application in pressure spray washing operations. Cowles Chemical Co.

Research Chemicals

Price list of company's recent additions to their catalogue of special products for nutritional research; biochemicals and diet materials offered are for chemical and investigational use only. General Biochemicals, Inc.

Equipment

Safety Heads

51-p. pamphlet covering the subject of safety heads, a device designed to protect equipment wherever overpressure is a problem, and especially useful in guarding against damage resulting from sudden buildups of overpressure within pressure systems; bulletin explains component parts, tells where and how safety heads should be used. Black, Sivalls & Bryson, Inc.

Electric Motor Drives

8-p. bulletin discussing electric motor drives for pulp mills, describes drives for barkers, saws, chippers, grinders, materials handling, etc. General Electric Co.

Speed Reducers

Companion bulletins covering respectively the firm's double reduction speed reducer series and the single reduction series; both furnish comprehensive data in tabular form intended to aid the engineer in selecting the right reducer for any installation, knowing only the horsepower required and the speed and size of the shaft to be driven. Dodge Manufacturing Corp.

Laboratory Equipment

6-p. folder illustrating and describing 37 scientific instruments, laboratory apparatus, and safety devices developed during the last two years, which have been made available since the firm published its most recent catalog supplement. Fisher Scientific Co.

Stainless Steels

16-p. booklet affording technical information on the properties, available forms and fabrication of two new stainless steels, that can be hardened at low temperatures, this low-temperature hardening phenomenon being known as precipitation hardening. Armco Steel Corp.

Catalyst Level Measuring

2-p. bulletin discussing operating principles and typical applications of atomic energy-operated device designed primarily for measuring catalyst level in a catalytic cracking unit, but also applicable for the measurement of all liquid levels and fluid densities through container walls. Minneapolis-Honeywell Regulator Co.

Stainless Steel Tubing

104-p. handbook entitled, "The Properties and Methods of Working Seamless and Welded Tubes and Pipe of Stainless Croloys," intended to help engineers, designers and fabricators in choosing the proper material and in planning the conversion of stainless steel tubing into finished products for industry; data tables cover physical and mechanical properties, processing data, etc. The Babcock & Wilcox Tube Co.

Gas Cleaning

Bulletin featuring, "Liqui-jector," a device providing for automatic cleaning of large volumes of compressed air and other gases contaminated with water, free oil, water-oil emulsions and dirt. Selas Corp. of America.

General

Consultant Organization

16-p. brochure entitled, "A Case Book of Calva Research," reviews the work of J. B. Calva & Co., chemical, mechanical and electrical research engineers in the field of products and process development in addition to the patent line and other diverse consultant services. J. B. Calva & Co.

ADVERTISER'S INDEX

American Polymer Corp. 1
Antara Products, A Division of General Dyestuff Corp. 22
Atlantic Refining Co., The 6
Baker & Adamson Products, General Chemical Division Allied Chemical & Dye Corp. . . . . 3rd Cover
Baker Chemical Co., J. T. 19
Barrett Division, Allied Chemical & Dye Corp. 12
Celanese Corporation of America . . . 27
Chemical Manufacturing Co. 36
Chemical Solvents, Inc. 45
Continental Can Co. 32
Delta Chemical Works 44
Distillation Products Industries, A Division of Eastman Kodak Co. . 20
Dow Corning Corp. 45
Emery Industries, Inc. 31
Fisher Chemical Co., Inc. B34
General Biochemicals, Inc. 45
Hardesty Chemical Co., Inc. 30
Harshaw Chemical Co., The 9
Hercules Powder Co. 28
Jefferson Chemical Co., Inc. 38
Koppers Co., Inc. 4
Lucidol Division, Novadel-Agene Corp. T37
Mallinckrodt Chemical Works 35
Mann & Co., Inc., George 45
Mathieson Chemical Corp. . . 2nd Cover
Metal Textile Corp. BL37
Monsanto Chemical Co. 10-11
Oronite Chemical Co. 24
Raymond Bag Co. 3
Sauereisen Cements Co. 45
Sharples Chemicals, Inc. 2
Snell, Inc., Foster D. T34
Starkweather Co., Inc., J. U. 45
Ultra Chemical Works, Inc. 43
Witco Chemical Co. . . . . Back Cover
Wyandotte Chemicals Corp. 5

BUSINESS STAFF

SALES MANAGER . . . . Bayard E. Sawyer
BUSINESS MANAGER . . . . Albert E. Weis
Atlanta . . . . . Ralph C. Maultsby, 1311 Rhodes-Haverty Bldg., Atlanta 3, Ga.
Chicago . . . . . Alfred D. Becker, Jr., Frank C. Mahnke, Jr., 520 N. Michigan Ave., Chicago 11, Ill.
Cleveland . . . . . Vaughan K. Dissette, 1510 Hanna Bldg., Cleveland 15, Ohio
Dallas . . . . . Jos. H. Allen, First Natl. Bank Bldg., Dallas 1, Texas
Los Angeles . . . . . Carl W. Dysinger, H. L. Keeler, 1111 Wilshire Blvd., Los Angeles 17, Cal.
New York . . . . . Knox Armstrong, Robert S. Muller, Charles L. Todaro, 330 West 42 St., New York 18, N. Y.
Philadelphia . . . . . William B. Hannum, Jr., Architects Bldg., 17th & Sansom Sts., Philadelphia 3, Pa.
San Francisco . . . . . Ralph E. Dorland, John W. Otterson, 68 Post St., San Francisco 4, Calif.
Boston . . . . 1427 Statler Bldg., Boston 16
Detroit . . 856 Penobscot Bldg., Detroit 26
Pittsburgh . . 738 Oliver Bldg., Pittsburgh 22
St. Louis . . 3615 Olive St., Continental Bldg., St. Louis 8

FOR SPORTSMEN ONLY···

Which of these game fish can you identify?

1 *Generally considered a peppier fighter than its big brother, this species was recently introduced in Florida where it sometimes tops the 15-pound mark!*

2 *A worthy game fish that often reaches 25 pounds; its white flaky flesh makes it popular on the table.*

3 *One of the "fightenest" of fighters, often jumping clear out of the water after the fly, then leaping repeatedly when hooked!*

4 *Known as the fresh-water barracuda, these monsters of our inland lakes run to ninety pounds or more!*

See next column for answers.

Just as these game fish are representative of the many species sportsmen seek throughout the country, the above products are typical of the many "B&A Quality" Fine Chemicals used in modern industry. To meet the varying demands of the day, B&A produces an extremely diversified line of fine chemicals. A new booklet, FC-5 contains a complete listing. Write today for your free copy.

FOR CHEMICAL USERS ONLY···

Which of these B&A Fine Chemicals fit your production needs?

★ POTASSIUM ACETATE

Finding increasing use as a substitute for glycerine as a humectant, this quality chemical is produced in three grades to meet varying industrial requirements. The N. F. Crystal and Technical Crystal, assaying 99% CH_3COOK, are shipped in 100 and 300-pound fiber drums, while the 60% Solution Technical is available in 13-gallon carboys and tank cars.

★ BORON TRIFLUORIDE

Among the BF_3 compounds now commercially available from B&A are Boron Trifluoride Ether Complex, Phenol Complex and Compressed Gas. These versatile fluorine catalysts offer multiple advantages and economies for a wide range of reactions including polymerization, alkylation, arylation, condensation, isomerization, esterification and cyclization.

Extensive production and research facilities place Baker & Adamson in a preferred position to work with you in development of other BF_3 derivatives or complexes to meet individual specifications.

★ FERROUS AMMONIUM SULFATE, Tech.

A uniform light green crystal, this versatile B&A Fine Chemical assays a minimum of 98% $FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$. The high quality of this product makes it suitable for photography, the manufacture of printing and carbon paper inks, and the electroplating of iron as well as other industrial applications which require a high quality Mohr's Salt.

★ C. P. (Reagent) ACIDS

Tonnage requirements of B&A C.P. Acids are produced to meet the same strict A.C.S. specifications as the laboratory product. This permits the use of these chemicals in critical process operations where further purification might otherwise be necessary.

Stocks are available from Coast to Coast producing and distributing points to serve your particular process needs.

As a sportsman, you're familiar with these game fish by the following names: (1) Small-Mouth Bass, (2) Wall-Eyed Pike, (3) Rainbow Trout, (4) Muskalonge.

REAGENTS
B&A
STANDARD OF PURITY
FINE CHEMICALS

BAKER & ADAMSON *Fine Chemicals*

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

Offices: Albany • Atlanta • Baltimore* • Birmingham* • Boston • Bridgeport* • Buffalo* Charlotte* • Chicago* • Cleveland* • Denver* • Detroit* • Greenville (Miss.) • Houston* Jacksonville • Kalamazoo • Los Angeles* • Minneapolis • New York* • Philadelphia* Pittsburgh* • Providence* • St. Louis* • San Francisco* • Seattle • Yakima (Wash.)
In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.
In Canada: The Nichols Chemical Company, Limited • Montreal* • Toronto* • Vancouver*

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

* Complete stocks are carried here.

let WITCO-MADE products

HELP MAKE YOUR PRODUCT BETTER

Witco's long line of basic materials for the chemical industry can be more valuable than ever, now that shortages are prevalent.

Why not look over this wide variety of Witco products? There's a good chance that—like other manufacturers—you will find some of Witco's available materials can replace hard-to-get items in your formulation. And better still—your product might be improved because of the change.

Put Witco's technical service to work for you. Write or call us *today*.

Investigate these Witco-made products

- Aluminum Octoate
- Asphalt
- Asphalt Specialties
  - Automobile Undercoatings
  - Rust Preventives
  - Sound Deadeners
  - Vibration Dampeners
- Carbon Blacks
- Copper Oleate
- Copper Naphthenate
- Driers
  - Naphthenic Acid Driers
    - Lead • Cobalt • Calcium
    - Manganese • Iron • Zinc
  - Octoic Acid Driers
    - Lead • Cobalt • Calcium
    - Manganese • Zinc
  - Witall Driers (Tall Oil)
    - Lead • Cobalt • Manganese
- Lead Resinate
- Lead Oleate
- Manganese Oleate
- Metallic Stearates
  - Aluminum
  - Barium
  - Cadmium
  - Calcium
  - Lead
  - Lithium
  - Magnesium
  - Strontium
  - Zinc
- M. R. (Hard Hydrocarbon)
- Monty Wax
- Rubber Compounding Ingredients
- Sunolite (Anti-Sunchecking Wax)
- Vinyl Stabilizers
- Witcarbs
- Witcotes

WITCO CHEMICAL COMPANY

295 Madison Avenue, New York 17, N.Y.

Los Angeles • Boston • Chicago • Houston • Cleveland
San Francisco • Akron • London and Manchester, England